AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., Under Act of March 3, 1879.

Volume 88
Number 6
$1.00 a Year

APRIL, 1924

Published monthly by
W. B. C. Smith Publishing Co.
Dalton and Atlanta, Ga.

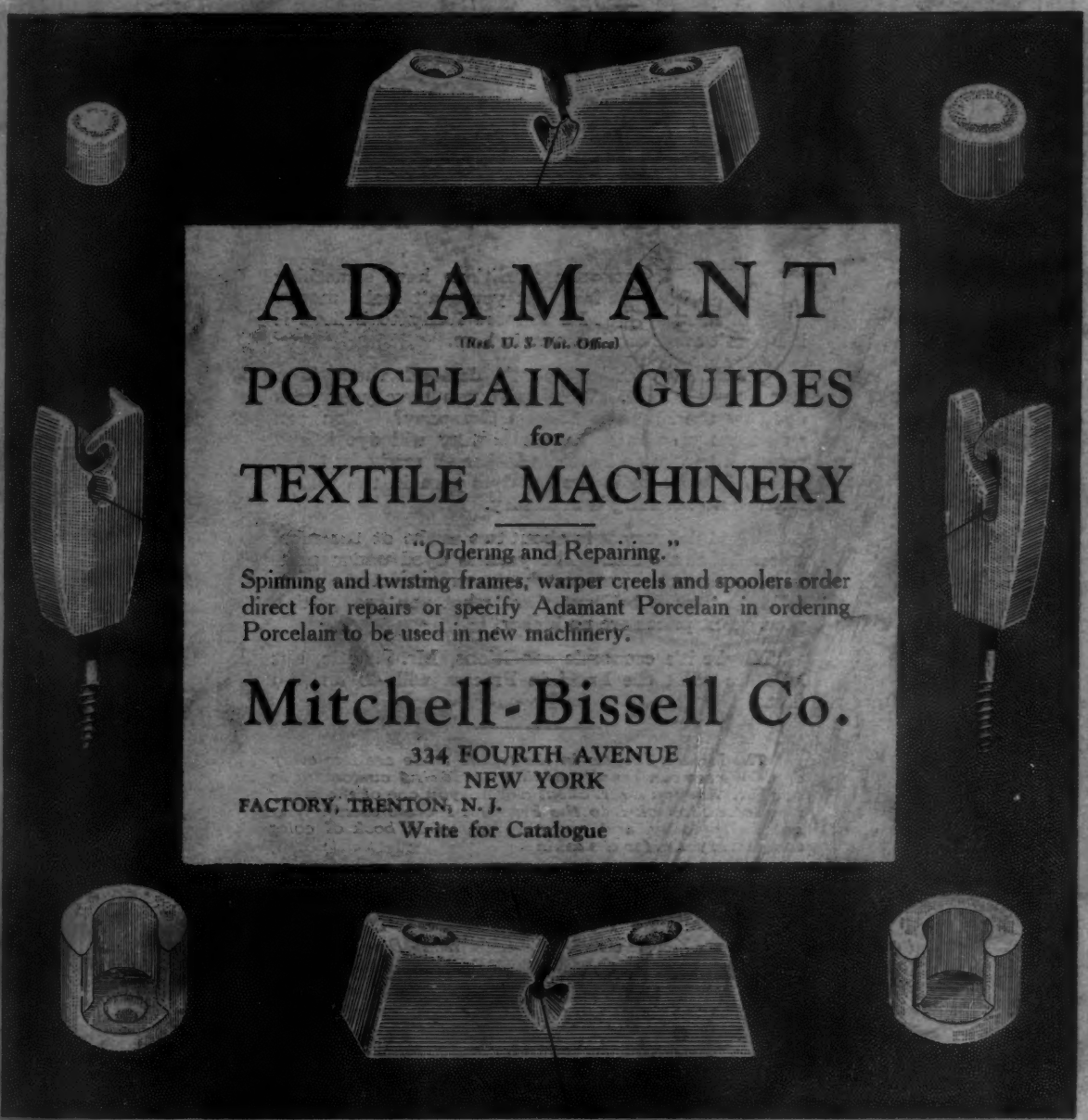
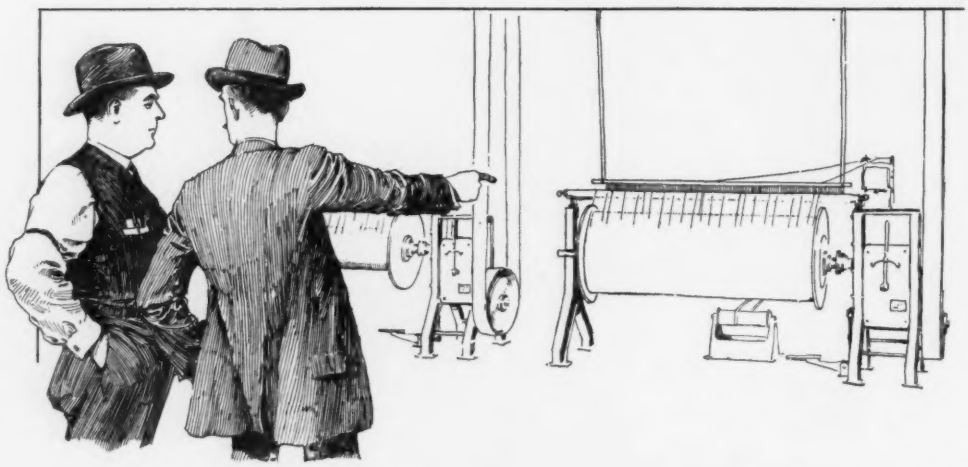

ADAMANT
(Reg. U. S. Pat. Office)
PORCELAIN GUIDES
for
TEXTILE MACHINERY
"Ordering and Repairing."
Spinning and twisting frames, warper creels and spoolers order direct for repairs or specify Adamant Porcelain in ordering Porcelain to be used in new machinery.
Mitchell-Bissell Co.
334 FOURTH AVENUE
NEW YORK
FACTORY, TRENTON, N. J.
Write for Catalogue

Table of Contents, Page 45. Buyers' Guide, Page 284. Advertisers' Index, Page 296.



"And You Call It 'Economic Conditions' with those Beamers in Your Mill

"PERHAPS economic conditions have something to do with the fact that you can't make money in this mill, but I'd be more likely to believe it if I didn't see those beamers in here.

"Modern practice doesn't demand them in a colored goods mill. Why don't you have your yarn dyed by the Franklin Process Company? You can ship them yarn on bobbins and they will dye it and return it to you on Franklin Tubes all ready for the V creel. The Franklin Process dyes yarn in the wound form so no beaming is necessary.

"And delivery is in about two weeks at the most instead of in months. The yarn is dyed under pressure, so the colors completely penetrate and are more solid and more briliiant than what you are getting now. But prices are no higher.

"Maybe it's economic conditions, Mr. Skeptic, but let's see what the Franklin Process will do for you first."

The Messrs. Skeptic in the textile trade are less every day. We are continually adding new dying customers to our list. Are you a Mr. Skeptic or are you one of the many who intend to look into the Franklin Process soon? Why not do it today and save money? Our book of color samples is yours for the asking.

FRANKLIN PROCESS COMPANY

Yarn Dyers · Yarn Merchants · Mfrs Glazed Yarns · Dyeing Machines

Philadelphia · PROVIDENCE · Manchester, Eng.

New York Office 72 Leonard St.

SOUTHERN FRANKLIN PROCESS COMPANY

Greenville, S. C.

You Can't Control
The Price of Cotton

You Can't Change
The Price of Labor

But

You Can Reduce
The Cost of Labor

By Proper and Effective Use of

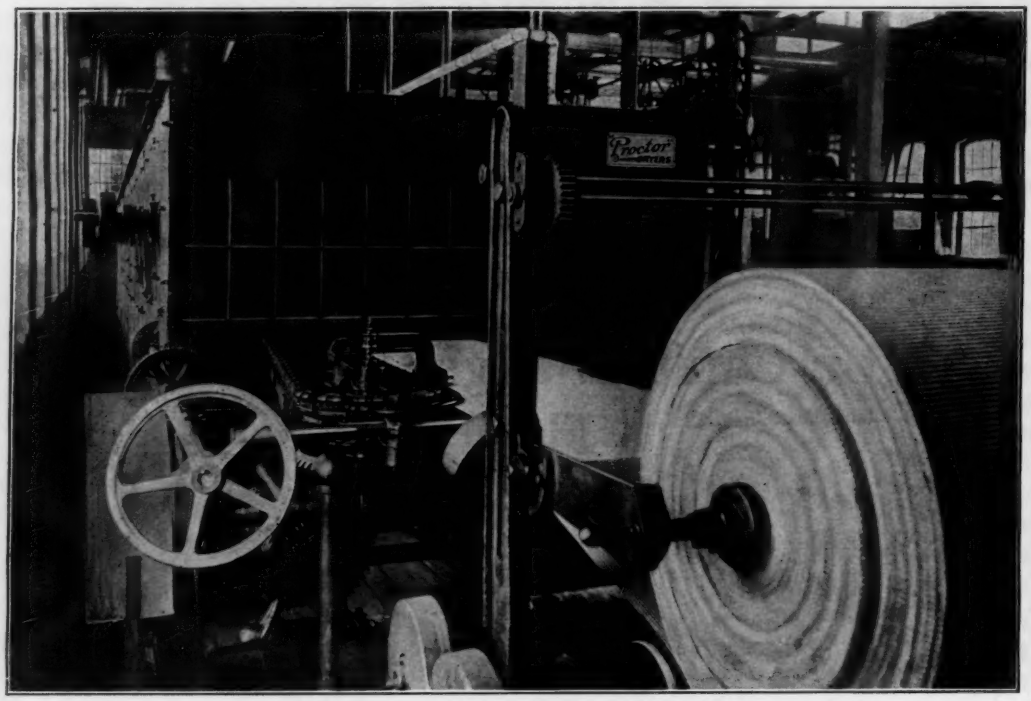
Northrop Automatic Looms

Let's Talk It Over

DRAPER CORPORATION

Southern Office Atlanta Georgia Hopedale Massachusetts

Copyright 1917 by Draper Corporation



An Improvement for Tentering Machines

The capacity of an open tentering machine can be increased from 25% to 100%—without increasing the size of the tenter or requiring additional operators—by "closing in" that machine with the "Proctor" Housing and Air Recirculation System.

The "Proctor" equipment is comprised of an insulated enclosure containing steam coils and fans which combine to produce a confined, efficient circulation of uniformly heated air through the cloth in the tenter. Uniformly perfect drying is obtained at a high rate of speed. Great savings in steam, labor and space effect radical savings in tentering cost. Also due to the confinement of heat, the surrounding work rooms are made comfortable for operatives.

After installing the "Proctor" equipment pictured above, the Highland Park Manufacturing Company wrote us as follows: "We are now running our tenter at the rate of 80 yards per minute and could run faster . . . . . we find it necessary at times to throttle down the steam to prevent the housing from getting too hot . . . . . this housing solves the problem of drying cloth when passing through a tentering machine and is far above anything else that has ever been used."

This is a typical experience. Many other cotton and woolen goods mills have made far-reaching, profitable improvements by installing "Proctor" Housings for tenters of all types and makes.

Send for our Bulletin No. 62.

PROCTOR & SCHWARTZ, INC.

PHILADELPHIA

SKF

Ball Bearings on Spinning Frames
Reduce Vibration—Save Power and Belts

VIBRATION in spinning frames, principally due to wear in plain cylinder bearings, causes variations in the yarn and results in expensive repairs to the cylinder with consequent loss of production.

Skayef self-aligning ball bearings on cylinders prevent vibration, insuring a uniform twist in the yarn, eliminate costly cylinder repair bills and maintain continuous production. After years of operation their service is unimpaired as wear is immeasurable. The starting load, too, is also greatly reduced resulting in savings on belts, fuses and power.

The housings of Skayef ball bearings are sealed against leakage of lubricant, assuring cleanliness and freedom of damaged product from dripping oil as in plain bearings.

These features of Skayef ball bearings have caused many manufacturers to change over their plain bearing equipment. Our engineers will gladly co-operate in meeting your particular requirements.

THE SKAYEF BALL BEARING COMPANY

Supervised by SKF INDUSTRIES, INC., 165 Broadway, New York City

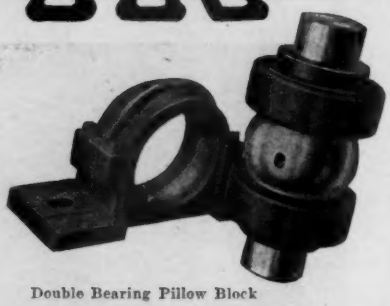
1129

Normal View *Deflected View*

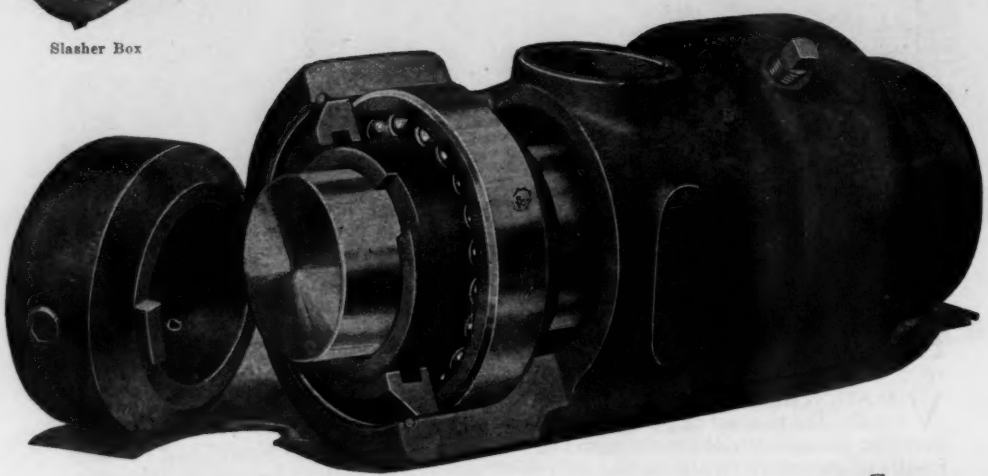
FAFNIR

Slasher Box

Blower and Fan Box

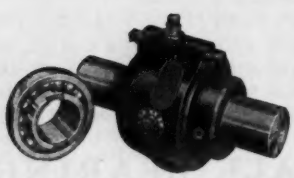


Double Bearing Pillow Block



Fafnir Double Ball Bearing Hanger Box

Fan Box



Single Bearing Hanger Box

Beater Box

Fafnir Ball Bearing units for textile machinery are most simple in construction, easiest to install, most efficient in operation.

All Standard Types and Sizes.

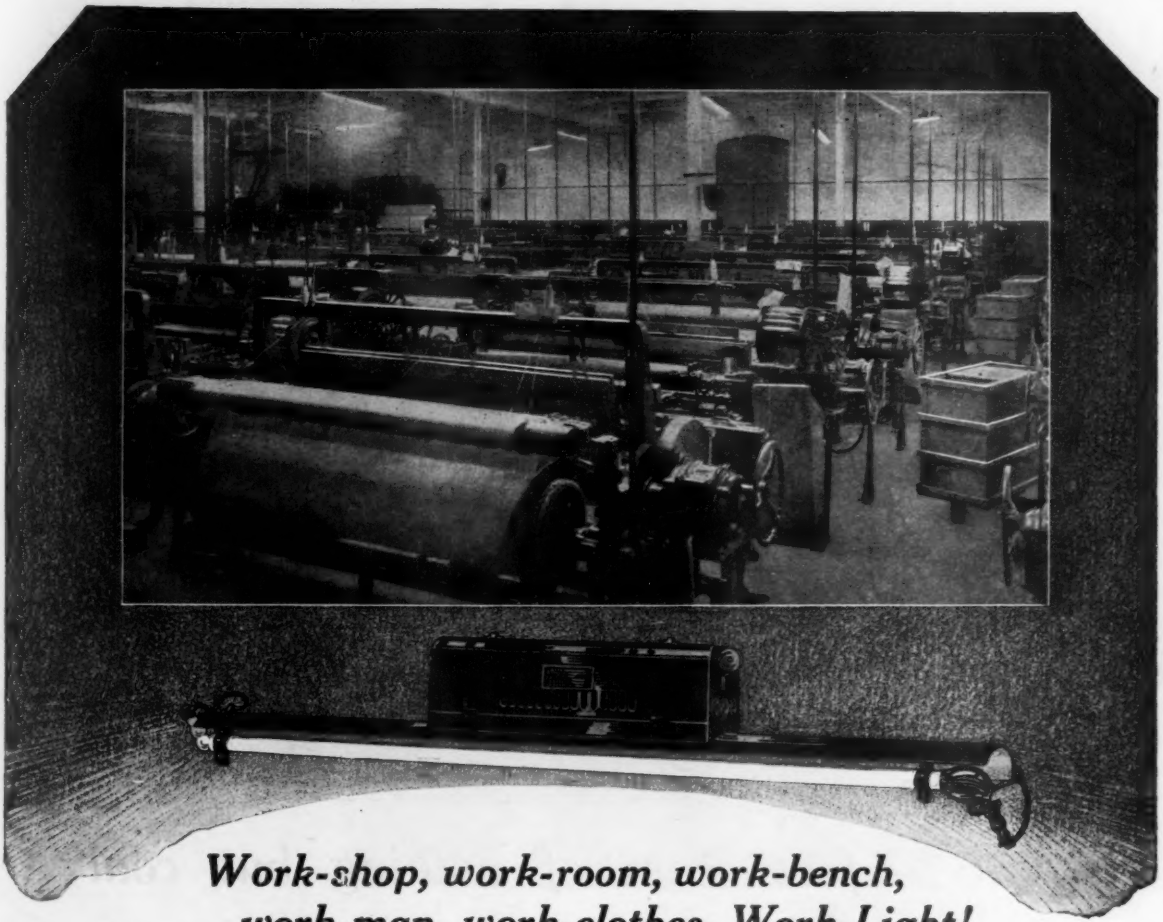
THE FAFNIR BEARING COMPANY

New Britain, Conn.

Southern Representatives

O. R. S. POOL
220 Vail Ave., Charlotte, N. C.

A. G. LAUGHRIDGE
P. O. Box 1847, Atlanta, Ga.



Work-shop, work-room, work-bench, work-man, work-clothes, Work-Light!

The illustration shows a night view in the plant of the Brighton Mills at Passaic, N. J., where Work-light has been installed since 1908.

Executives interested in industrial lighting are invited to inspect the Work-Light booth at the Knitting Arts Exposition in Philadelphia, April 7 to 11. Our representatives there will be glad to discuss individual lighting problems.

THE oldest thing among them sounds as though it were new—but it merely suggests a new way of thinking about light. Work-Light is the new name for Cooper Hewitt light.

The workman has always had light. For more than twenty years, some workmen have had Cooper Hewitt Work-Light. But they have known it under a name that did not make clear that it was different from any other light.

It had to be a different light, or we could not have called it Work-Light. Not just a different type of lamp, or some unique lighting unit—but a totally different kind of illumination, serving specifically the purpose of work.

Long before it had its present name, Cooper Hewitt light was the work-light of leaders in the automobile, rubber, textile and machinery fields. It had advantages in both production and maintenance that leaders were quick to seize and employ in the constant war of attrition against overhead and production costs.

Use, and consistent performance, made Work-Light its logical name.

The "how of it" is a story that appeals to the practical man. Mostly, it is told in the even diffusion of glareless light by the long Cooper Hewitt tube. There are no gleaming light sources to dazzle the eyes; no dark, deep shadows to cause confusion or doubt. Light gets everywhere—over, under and around. It facilitates work motions by making the work easier to see—and it does away entirely with grumbling over light, because it is even and constant in every part of the room.

A book called "Work-Light" tells it all. It is yours for the asking. Send your letterhead with a penciled memo now. Cooper Hewitt Electric Co., Hoboken, N. J.
89 River Street

COOPER HEWITT

Work-Light

C C.H.Co-124

A 6 1-2 foot seam of nothing but coal

STONEGA
Steam and By-Product Coal

RODA
Gas and By-Product Coal

Admiralty Coal
New River Smokeless

DEPENDABLE COAL
Finest Anthracite

Not coal, rock, slate and dirt, but clean coal, of the finest quality —nothing else. And this pure seam runs for miles, assuring our customers of unvarying quality for years to come.

It is vast resources like the above that account for much of our customers' satisfaction in having contracts with General Coal Company. Such contracts guarantee them fuel of a uniform quality and at a price which can be accurately budgeted in their production costs. With unlimited tonnage resources from the various fields, General Coal Company is able to meet the requirements of the industries of the country.

We will gladly submit you quotations on coal best suited for your requirements.

GENERAL COAL COMPANY

1727 Land Title Building

PHILADELPHIA

BUNKER COAL
Supplied at
Baltimore, Md.
Charleston, S. C.
Jacksonville, Fla.
Norfolk, Va.
Savannah, Ga.

BOSTON,
CHARLESTON
CHARLOTTE

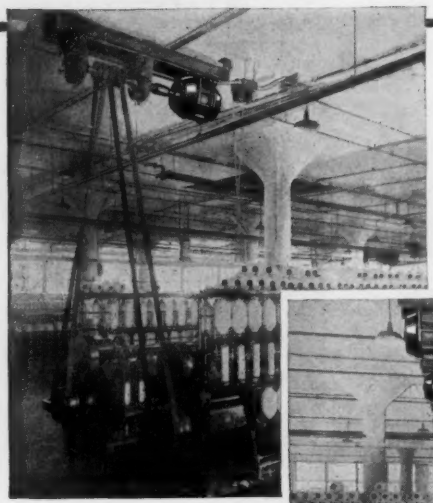
EXCLUSIVE SALES AGENT
—FOR—
STONEGA COKE & COAL CO.
HAZLE BROOK COAL CO.
—AND—
SUCCESSOR TO
WENTZ COMPANY

DETROIT
NEW YORK
NORFOLK

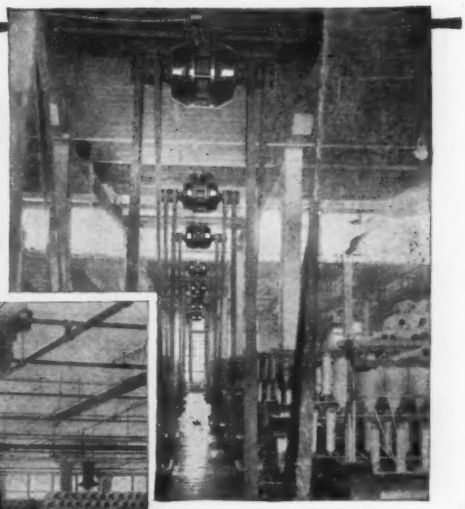
EXPORT
AND COASTWISE
COAL
Loaded at
Baltimore, Md.
Charleston, S. C.
Norfolk, Va.

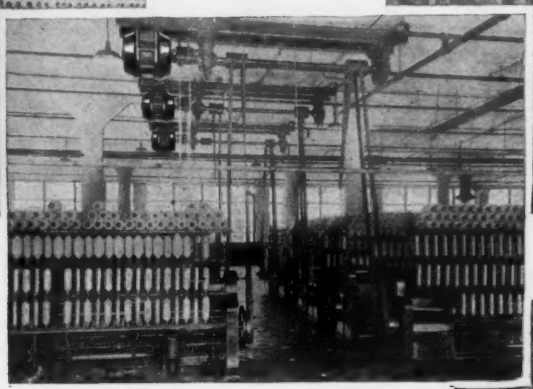
Cotton

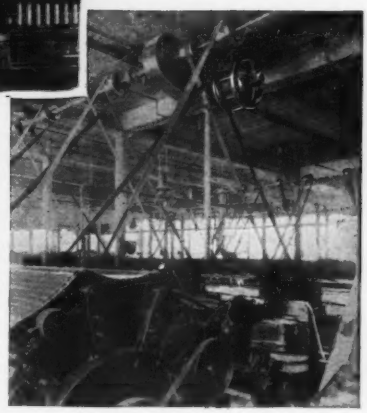
The Clean and Efficient Drive



Carding and Roving







Best Results with G-E Motors

The use of G-E Motors provides a clean, successful way of driving Card Room machines.

All the machinery in the Card Room can utilize the light group drive method to advantage, but the tendency is more and more toward the individual drive where feasible, and where its advantages are apparent.

For individual drive, totally enclosed G-E Motors of the loom motor type, controlled by enclosed hand-operated switches giving time element thermal fuse protection, are recommended.

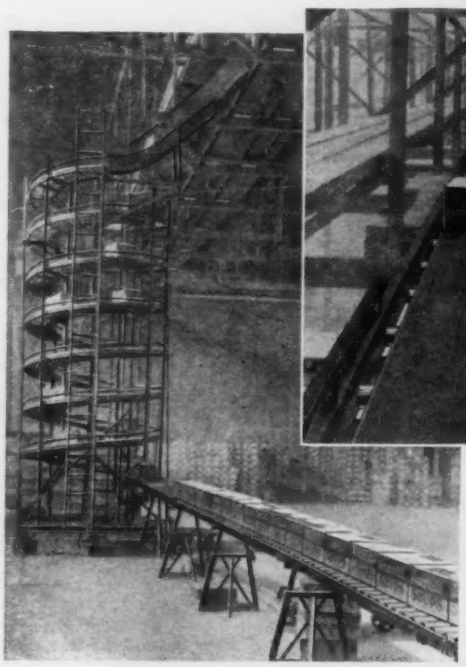
Slubbers, speeders and fine frames are usually driven in small groups, and good results are obtained by using either 2-frame or 4-frame drives, with G-E Motors of from 5-h.p. to 15-h.p. capacity.

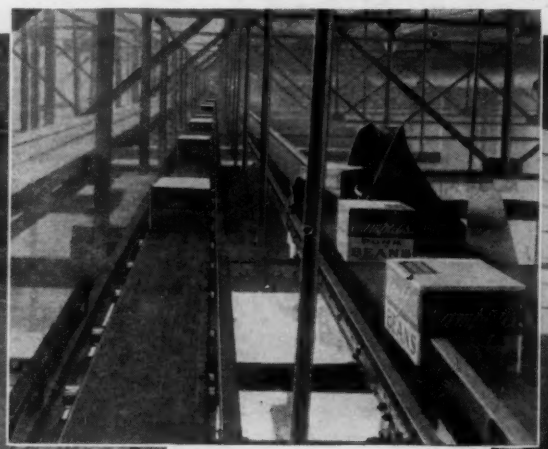
G-E engineers will gladly co-operate with you in securing the most efficient motor drive for your machines.

General Electric Company
Schenectady, N. Y.
Sales Offices in all Large Cities

GENERAL ELECTRIC

44-B





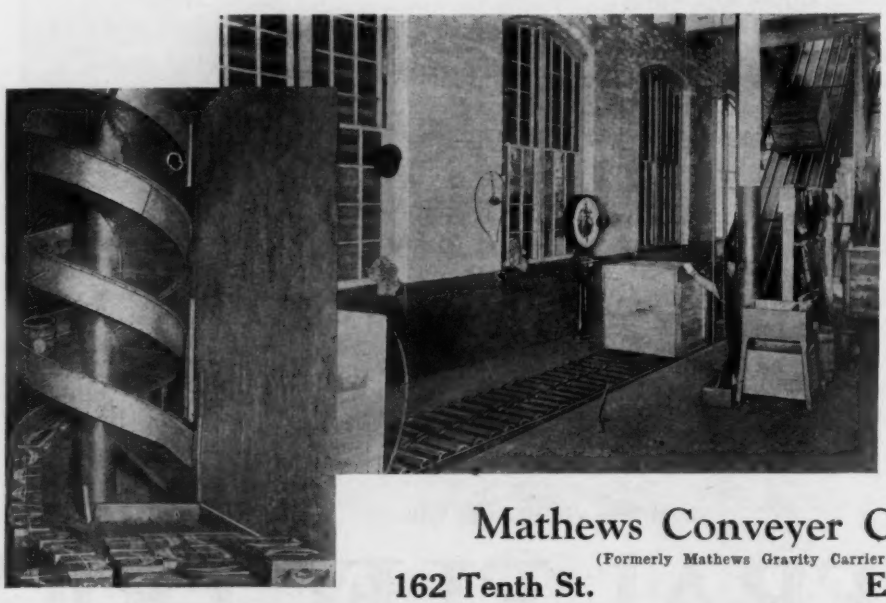
Soup or Cloth

Pictured above are three views of a modern conveying system for handling certain famous brands of soup. Below are two views of an equally large system handling 800-pound boxes filled with bolts of cloth.

Both are Mathews Systems.

We associate these two systems here to show that while in character the two industries are widely dissimilar, the handling problems in each are not nearly so divergent. In other words all products look pretty much alike when they are packed for shipment. The textile trades do, however, have some problems that are unusual and apparently difficult of solution. Such problems are being solved every day. Expert conveyor engineers are doing wonderful things for all classes of industries. Textile plants have afforded a particularly good field in which to apply the many advantages of mechanical handling. No matter what it is, light bobbins or heavy rolls or bales, a Mathews engineer will work out the problem of handling them mechanically.

40 Men and 700 Trucks Released.



That's what a Mathews Eight Thousand Dollar Conveying System accomplished in a Baltimore factory. The net saving per year is $47,400.00. The system is paying for itself every sixty days. Besides, 7,000 square feet of floor space has been released for other uses.

Personal Engineering Service

is promptly given all inquiries— — without cost or obligation.

Send for general catalog.

Mathews Conveyer Company

(Formerly Mathews Gravity Carrier Co.)

162 Tenth St. **Ellwood City, Pa.**

What Identifies Good Engineering?

Good engineering is identified by elements of design which assure continuity of service.

For example—

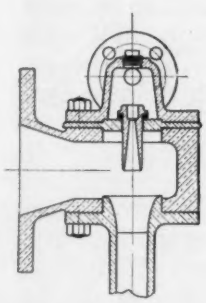
The steam nozzles of an air ejector must be large enough to allow scale and other foreign matter to safely pass through without obstructing the steam flow.

The large nozzles of the Westinghouse Leblanc Air Ejector so effectively prevent clogging that, under ordinary conditions, a steam strainer is unnecessary.

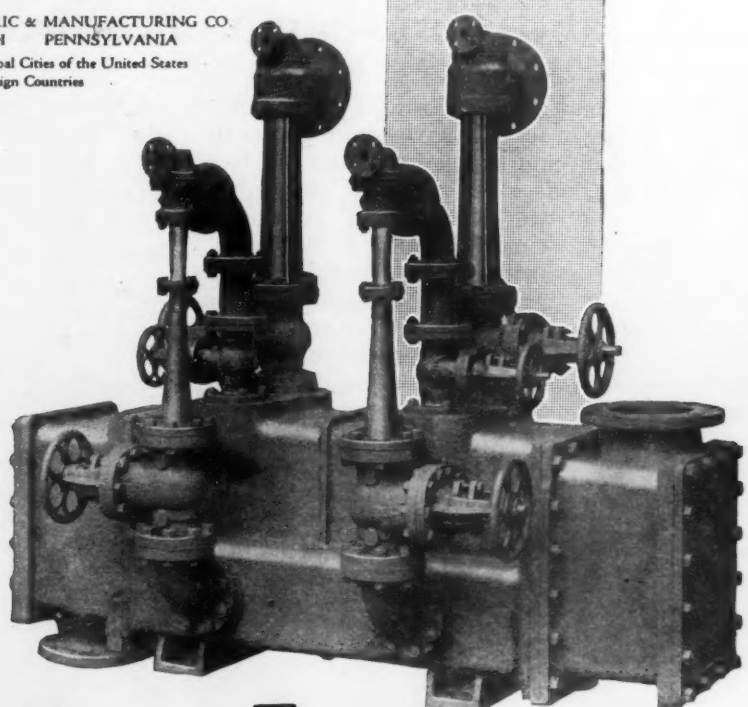
The two-stage Westinghouse ejector, illustrated below, has one single nozzle per stage.

Single nozzle construction is one of the characteristics making the Westinghouse Leblanc Air Ejector a real **safeguard to service.**

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
EAST PITTSBURGH PENNSYLVANIA
Sales Offices in All Principal Cities of the United States and Foreign Countries

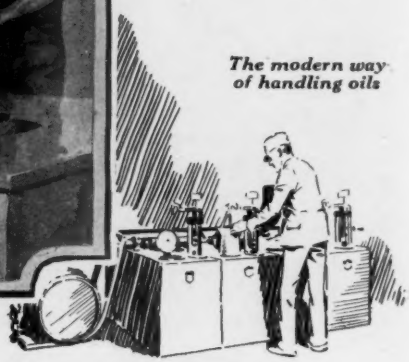


Single Nozzle
Construction
Safeguards
Service



Westinghouse

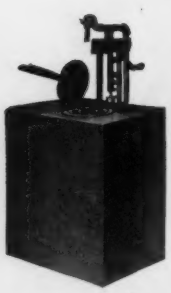
"Tapping" a barrel by old-time methods



The modern way of handling oils

"I Emphasized the Cleanliness, Convenience and Time-Saving Features of this System"

"I knew that we were losing a great part of the value of our oils through gumming, evaporation and leakage and, our old fashioned methods of storing and serving oils were 'eating up' employees' time. Finally I insisted on installing an American Storage System, stressing its *cleanliness, convenience* and the *time* it would save us—to say nothing of the lower insurance rate we could get and the lower prices on oils because of bulk buying. Now, we would not be without our American System for an instant—it's saving over half the value of our oils."



Cut 36, Pump with meter attached

A convenient manner for storing and serving oil into containers in exact quantities. Heavy, durable construction; discharges quart or pint at single stroke. *Ask for Bulletin 400.*

Install this Clean Oil Service and Storage System

Begin right now to check the waste and instead, make savings on your oils. Many concerns, on checking up carefully, have found *over 50 per cent oil value* was being wasted—and they *saved enough*, after installing an American Storage System to soon pay its cost.

The American System is the *modern way* of storing and dispensing oils. Fire hazard is eliminated. Oils are served quickly. Your place is always clean and inviting. It's so convenient that no time is lost by employees.

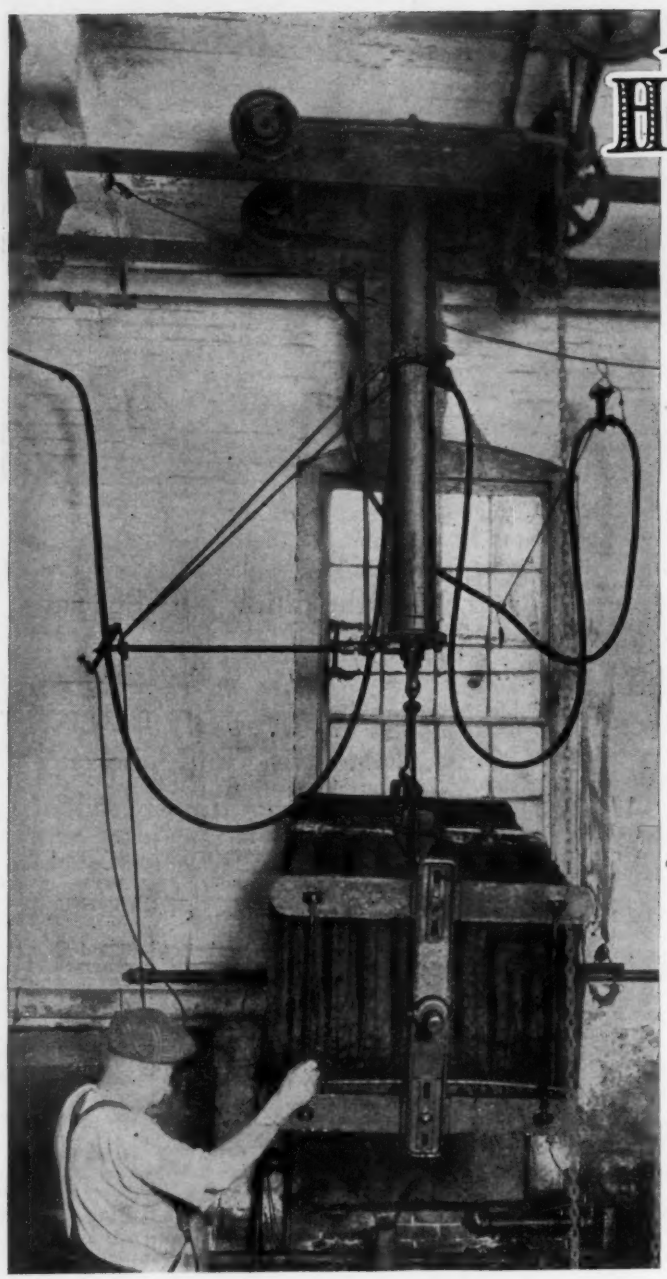
Write us now—let us describe an American System adapted to your special requirements. No obligation in getting particulars and we will gladly send, on request, Bulletin 203—which tells how you can reduce oil wastage.

The American Oil Pump & Tank Co.

1179 FINDLAY STREET, CINCINNATI, OHIO.

CURTIS

AIR HOISTS



Used in The Textile Industry

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Company

1571 Kienlen Ave., St. Louis, Mo.

Branch Office

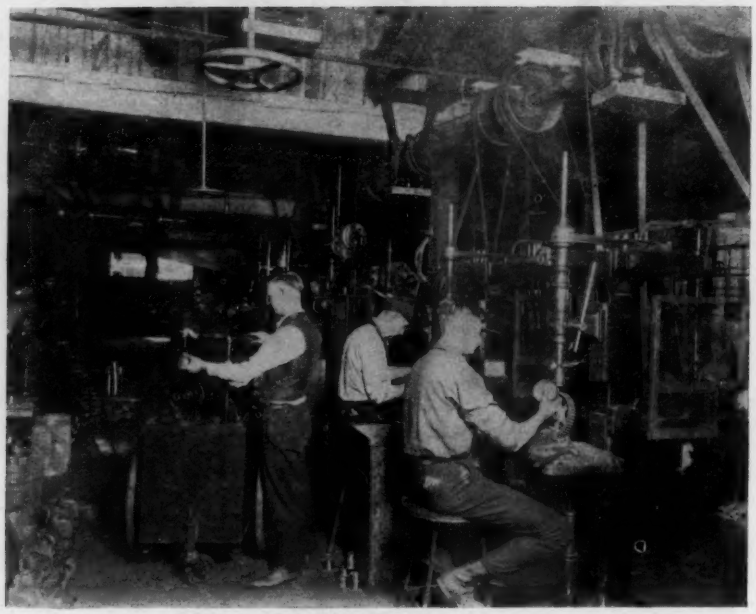
532-R Hudson Terminal, New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M.Co.

Established 1854

BOWSER ESTABLISHED 1885

A Boy's Legs Plus Wheels



Where many oilers are to be served a boy with a Bowser wheel tank (Model 154) is a real economy.

The tank can be moved from machine to machine—and just as easily, from department to department, for replenishing departmental storage tanks. The boy goes along, furnishing motive power, and doing the filling job, thus saving men's time.

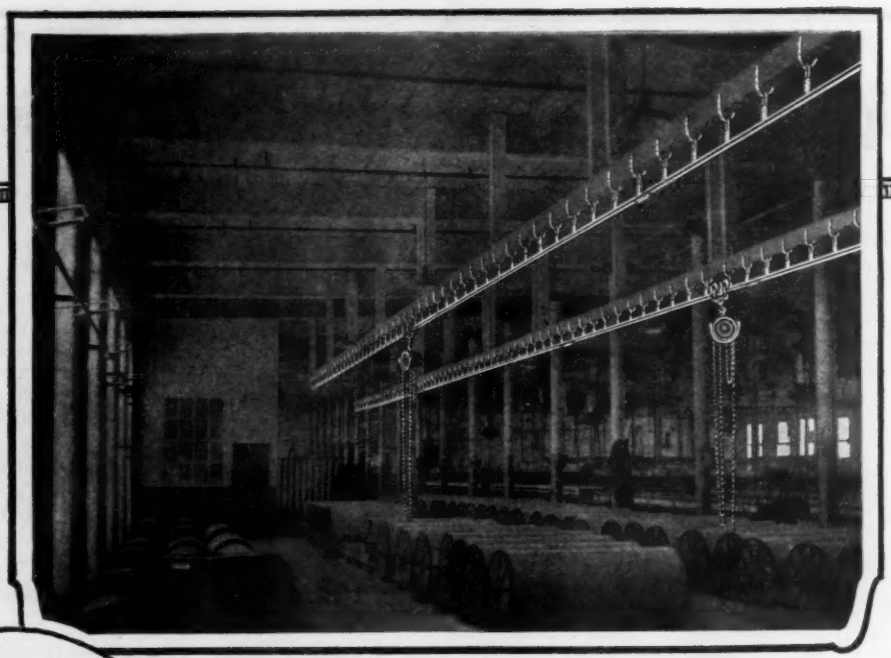
Bowser engineers have come across scores of oil-saving and labor-saving ways of using Bowser wheel tanks and departmental storage tanks. That fund of experience is at your service. Write to Dept. 45, and state your problem.

S.F.BOWSER & COMPANY, Inc.

Dependable Pumps and Tanks

FORT WAYNE, INDIANA, U.S.A.

Sales and Service Representatives All Over The World



Lanett Cotton Mills, West Point, Ga., equipped with Louden Overhead Carrying System. Stacking warp beams on platform.

Loads Up To 2000 Lbs.

Are easily handled by the Louden Overhead Carrying System—

From department to department—

From building to building—

Under any conditions.

The Louden Overhead Carrying System can be used for:

Conveying bales of cotton from warehouse to opening room.

Conveying warp beams to slashers for sizing and on to storage racks and looms.

Conveying raw cotton after dyeing, from kettles to storage rooms, and on to picker machines.

Conveying finished products from finishing departments to warehouses. Either inside of cases or in bales.

Handling machinery in machine shops or equipment in garages.

Moving coal, ashes, repair or building material.

For practically every load moving job in and around the mills.

By lowering operative costs the Louden Overhead Carrying System increases earnings.

It will pay you to investigate.

For a Larger Percentage of Profit

When you figure the high cost of lifting loom and section beams by hand, the breakage of beam heads, accidents to the men, loss of time, delays, etc., it is not difficult to see why so many mills are now using the

LOUDEN
OVERHEAD CARRYING SYSTEM

The illustration above shows how this system is used in the warper room of the Lanett Cotton Mills, West Point, Ga., for the storage of beams. Any beam desired is quickly and easily picked up and taken out. The Overhead System, which has done away with getting beams out by rolling them over the others by hand, is also used in front of the slashers to assist the men in doffing.

Practically every load lifting job about the mill, from coal handling to shipping platform, can be done quickly and cheaply with this equipment. Its easy adaptability to turns, corners, routing under line shafting and over machines and to all mill conditions is one of its most distinctive features.

The cost of Louden Overhead Carrying Equipment is so low that its savings wipe out the investment charge in just a few months. This is a point that impresses everyone who really looks into the possibilities of its use.

Let us suggest how this equipment could be used to profitable advantage in your mill. Investigate, without obligating yourself. Write for a copy of our illustrated catalog.

The Louden Machinery Company

551 West Ave. (Established 1867) Fairfield, Iowa

Albany Boston New York Philadelphia Buffalo Pittsburgh Cincinnati Cleveland Chicago St. Paul San Francisco Los Angeles

Equipment That Can Be Bought Cheap

Cotton Purification Equipment

35—Welded Steel Digesters. Made by Continental Iron Works. Capacity 1,300 cu. ft. Inside diameter 8'0", length overall 27'0". Shell 13/16", tank steel at bottom, tapered to 25/32" at top. Working pressure 110 lbs. per sq. in.

20—Six section No. 24 8 ft. cotton dryers. Equipped with Model "M" self feeders. 12,556 sq. ft. heating surface to dryer. Automatic sprinkler system throughout.

20—Mixing pickers, manufactured by Sargent's Sons Corporation. Cylindrical type, 48" size, 10 right hand, 10 left hand. Feed apron heavy leather belt with maple slats. Equipped with single pair fluted feed rolls 3½" diameter. Main cylinder heavy cast iron spiders mounted on 2 3/16" shaft. Capacity 600 to 800 lbs. per hour.

20—Cotton Washers, manufactured by Sargent's Sons Corporation. 48" special cotton washers or rinsers. Right hand and left hand. Complete with cast iron frame, pans, squeeze rolls, kicker and conveyor.

20—Feeders for Sargent Dryers. Model "M."

8—Concentrators. Manufactured by Noble & Wood Co. Right and left hand cylinder washers with octagon cylinder, diameter 44", length 42". Cylinder heads Gulf cypress. Buckets 1" native pine. Cast iron outlet with wide discharge openings. Steel shaft passes through center of outlet and flanged on opposite side. Outlet and Flange bolted to beaded cylinder head. Rotates at 6 r.p.m. Vat is 4'1¾" wide, 6'9" long, 2'9" high.

Power Equipment

7—823 h.p. Stirling Water Tube Boilers. Class M-30, 200 lbs. pressure. Babcock & Wilcox. Complete with Westinghouse Stokers, Forced Draft Fans, Vulcan Soot Blowers, and all accessories. Boilers were used less than ninety days.

4—15 and 26 x 20 x 24 Compound Duplex Laidlaw Compressors. Pressure 80 lbs., capacity 2,570 cu. ft. at 150 r.p.m.

5—Buffalo Forced Draft Fans, Type TD-9½, 100,000 cu. ft. capacity. Direct connected to 225 h.p. Moore Steam Turbine and reduction gear. Mounted on common base. Only slightly used.

2—Webster, Class B, Feed Water Heaters. Capacity 11,000 B.H.P. Size 10'5" high x 9'10" wide x 8'7" deep.

10—25 and 38 x 4⅝ x 24 Worthington Tandem Compound Duplex Pumps.

3—8" 3-stage Alberger-Curtis Steam Turbine Driven Boiler Feed Pumps.

6—14" Worthington Class B Centrifugal Pumps, with 300 h.p. turbine.

6—14" Allis-Chalmers Type S Centrifugal Pumps, with 300 h.p. turbine.

6—16" Allis-Chalmers Type S Centrifugal Pumps, with 300 h.p. turbine.

5—5¼ x 4¾ x 5 Worthington Duplex Steam Pumps.

18—6 x 2½ x 6 Worthington Duplex Steam Pumps.

8—Allis-Chalmers 18 x 36" 350 h.p. Corliss Engines. Heavy duty mill type. Double Eccentric. Complete with Richardson-Phenix oil filtration and lubricating systems. Both right and left hand available.

Steel Tanks

Size	Type	Capacity
25— 6' x 24'	Horizontal	5120
27— 8' x 30'	Pressure	11280
30—20' x 12'	Vert. Storage	28200
3—25' x 15'	Vert. Storage	55000

Made of plates ¼" to ⅝".

Write for Bulletin No. 7 listing over 500 steel tanks.

Transmission

Cold rolled steel shafting all sizes and lengths. Shaft hangers, all types and sizes.
Bearings, capillary, ring, and standard oiling.
Pillow blocks. Friction clutches, Dodge split, solid and jaw. Collars, solid, split and thrust. Pulleys, split and solid, cast iron, steel and wood. Bushings. Grease cups.

Transformers	Scales	Valves and
Motors	Blowers	Fittings

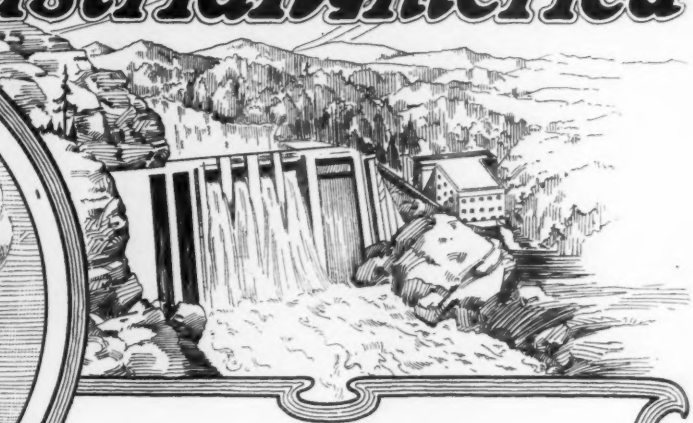
Write for prices and specifications.

NASHVILLE INDUSTRIAL CORPORATION

PURCHASERS OF OLD HICKORY POWDER PLANT

OLD HICKORY, TENNESSEE

Tennessee—The Heart of Industrial America



The Prediction of a Hundred Years Ago Now Coming to Pass

Years ago, they said that the logical place for a cotton mill was in the South where cotton was grown and that eventually the textile mill center would be in the South. That prediction is now coming to pass.

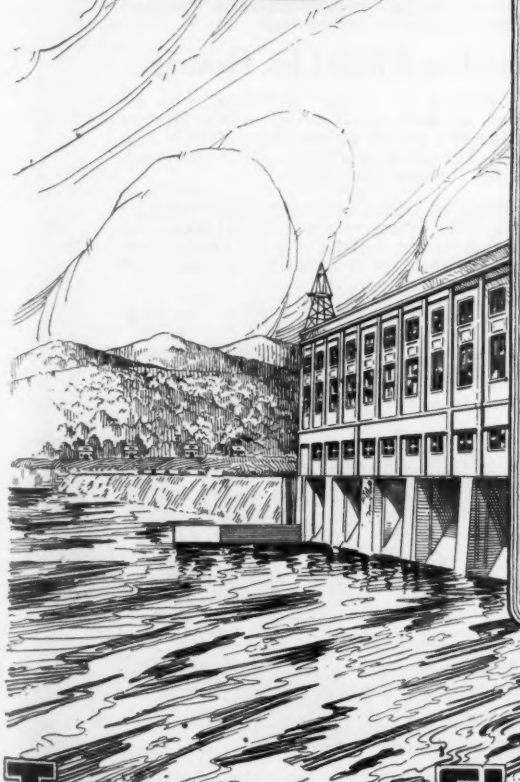
In the last 24 years Southern spindles increased from 4,495,038 to 15,871,805 or 253%, while the increase in other sections was only 23%. During the same period, Southern consumption of cotton increased from 1,479,006 bales to 4,248,525 bales or 187%, while the increase in consumption in other sections was only 11%. Today Southern mills are consuming 66.7% of the total cotton consumed in this country.

No other large industry has had such a remarkable expansion as have the textile mills of the South. And this expansion is increasing by leaps and bounds. Not only cotton mills, but large knitting, dyeing, bleaching and finishing plants are constantly being established in this section.

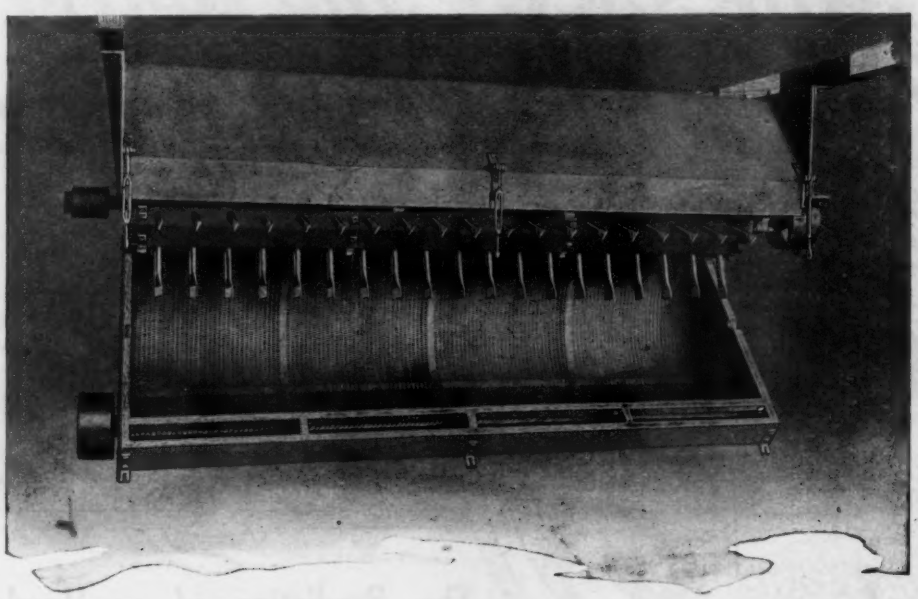
Tennessee is taking its place among the great textile manufacturing states of the country. Already 150 mills are prospering in this section. Probably no other state in the Union offers as many real advantages for the growth of the textile industry as does Tennessee—in the heart of industrial America.

For full information about this section write—

THE TENNESSEE ELECTRIC POWER CO.
CHATTANOOGA, TENN.



The Tennessee Electric Power Co.



Put Your Conveyor Pipe to Work

You can give your cotton a thorough cleaning, opening and aerating, while it's being conveyed from the bale breakers to the picker room. The Murray Cotton Cleaning and Aerating Machine forms a part of the conveyor pipe, and vastly improves the stock before it is fed to the pickers.

The "Murray" takes up very little extra space since it can be hung from the ceiling. Its supply of cotton is drawn through it by the suction of the conveyor pipe fan, no additional fan or increased draft being necessary. A further economical feature is the fact that the "Murray" requires practically no attention since the dirt is automatically disposed of through a chute at one end.

Handles 2,500 Lbs. Hourly.

2,500 pounds of cotton per hour can be cleaned, opened and aerated in the Murray machine at a power expenditure of only 3 to 5 H.P. The stock is given a thorough treatment by 114 revolving arms.

The Bowling Green Spinning Mills write us stating "The Opener we purchased from you is giving entire satisfaction in every way. In fact we think it is a wonderful machine."

THE MURRAY COMPANY, ATLANTA, GA.

Northern and New England Sales Representatives:
Aldrich Machine Works
P. O. Box 132, Providence, R. I

Carolina Sales Representatives:
Carolina Specialty Co.
Brevard Court
Charlotte, N. C.

The Murray
(PAT. PENDING)
COTTON CLEANING AND AERATING MACHINE

COTTON WELL OPENED IS HALF SPUN

THE FUN-FUL LINE

PLAYGROUND EQUIPMENT

349 Cotton Mills Using FUN-FUL!

A few of them

Pacific Mills—Columbia, S. C.
Columbia Mills—Columbia, S. C.
Wymojo Mills—Rockhill, S. C.
Woodside Mills—Greenville, S. C.
Pacolet Mills—Pacolet, S. C.
Drayton Mills—Spartanburg, S. C.
Monarch Mills—Union, S. C.
Langley Mills—Langley, S. C.
Grendel Mills—Greenwood, S. C.
Greenwood Mills—Greenwood, S. C.
Belton Mills—Belton, S. C.
Loray Mills—Gastonia, S. C.
Gray Mills—Gastonia, S. C.
Arlington Mills—Gastonia, S. C.
Flint Mills—Gastonia, S. C.
Cannon Mills—Kannapolis, N. C.
P. H. Hanes Mills—Winston-Salem, N. C.
Proximity Mills—Greensboro, N. C.
Durham Mills—Durham, N. C.
Roxboro Mills—Roxboro, N. C.
Tolar-Hart-Holt Mills—Fayetteville, N. C.
Hart Mills—Tarboro, N. C.
Pilot Mills—Raleigh, N. C.
Cardinal Mills—West Point, Miss.
Lauderdale Mills—Meridian, Miss.
Danville Mills—Danvillle, Va.
Schoolfield Mills—Schoolfield, Va.
Bonham Mills—Bonham, Texas.
Sherman Mills—Sherman, Texas.
Corsicana Mills—Corsicana, Texas.
Itasca Mills—Itasca, Texas.
Brazo Valley Mills—West, Texas.
Prendergast Mills—Prendergast, Tenn.
Davis Mills—Chattanooga, Tenn.
Avondale Mills—Birmingham, Ala.
Lanettt Mills—Lanett, Ala.
Anniston Mills—Anniston, Ala.
Montgomery Mills—Montgomery, Ala.
Fulton Bag Mills—Atlanta, Georgia.
Exposition Mills—Atlanta, Georgia.
Calloway Mills—LaGrange, Georgia.
Moultrie Mills—Moultrie, Georgia.
Trion Mills—Trion, Georgia.
LaFayette Mills—LaFayette, Georgia.
Bibb Mills—Macon, Georgia.
International Mills—LaGrange, Georgia.

At the Brazilian Centennial Exhibition at Rio de Janeiro, Brazil, South America, which has just closed, HILL-STANDARD Equipment was awarded the gold medals.

Catalog on request

HILL-STANDARD CO.

Anderson, Our 23rd year Indiana

BEST COPY AVAILABLE

WILLIS A. SUTTON, SUPERINTENDENT
H. REID HUNTER, ASSISTANT SUPERINTENDENT
MARY W. POSTELL, ASSISTANT SUPERINTENDENT
R. L. McCULLOUGH, BUSINESS MANAGER

OFFICE OF
BOARD OF EDUCATION
AND
SUPERINTENDENT ATLANTA PUBLIC SCHOOLS
ATLANTA, GA.

Southern Theatre Equipment Co.
Atlanta, Ga.

Gentlemen:--Regarding the educational value of the motion picture in public schools, I wish to call your attention to the following points:

1, 2, 3, 4, and 5--(see previous ads)

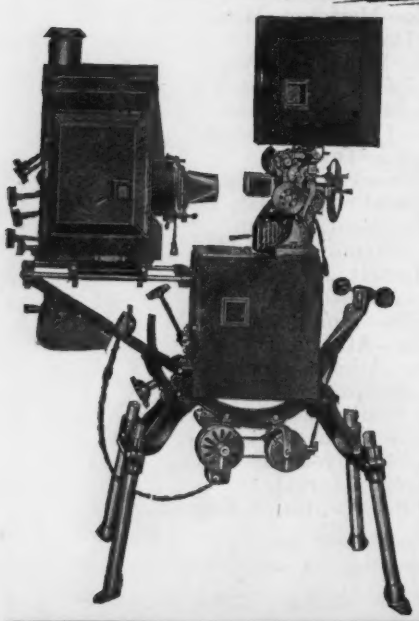
6.- PROCESSES ARE SHORTENED AND SIMPLIFIED, allowing pupil (in this case, his mind) to accomplish a given task with less labor, do more work in less time, and approach each task with less fatigue and more enthusiasm.

A letter from a man who knows

You may use any or all of this letter as you desire.

Very truly yours,

Joe W. Coffman
Supervisor, Visual Instruction,
Atlanta Public Schools.



VISUAL EDUCATION with the motion picture has already proven its value in city schools, and it will prove of even greater value in village and community schools because it accomplishes even greater results with less time and less experienced teachers.

Through the courtesy of Mr. Coffman, we are presenting each month in paragraph form, parts of a very enlightening letter which he has written us, and through Mr. Coffman also, we are able to give our textile mill friends valuable help and suggestions regarding the use of this system in community school work, the selection of the proper films, in fact the solution of every problem which may present itself.

Our service to textile mills is the result of years of experience, and we have installed Powers Motion Picture Projectors and theatre auditorium equipment in over 60 Southern mills. Whether it be a visual education system or complete motion picture theatre equipment, including screens, chairs, cooling systems, etc., we are ready to take the problem off your hands and turn the system back to you ready for operation.

May we present our special proposition to you?

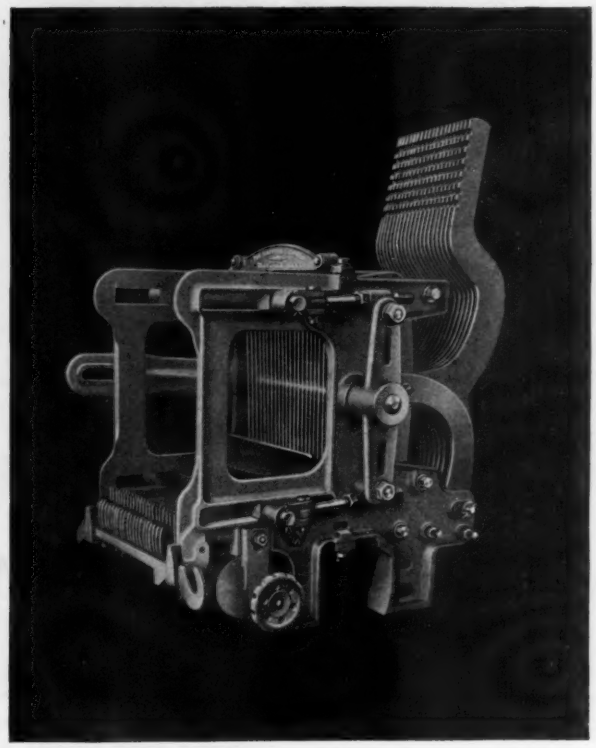
Southern Theatre Equipment Company

WILLIAM OLDKNOW, President.

100 WALTON STREET
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

1907 COMMERCE ST.
DALLAS, TEXAS



Stafford Improved Dobby

Why not take advantage of the vogue for fancy goods and equip your plain looms with dobbies? There is no better time to install them than the present.

Stafford dobbies have been used exclusively for a great many years by mills, large and small, both in this country and elsewhere. They may be attached to either our own or other makes of looms by application of the necessary fittings. Jumper motions, slackeners, etc., may be attached as desired. From a mechanical standpoint Stafford dobbies are unsurpassed in design, workmanship, accessibility of parts and general all-round excellence.

We have prepared a booklet dealing specifically with our dobby which we would be more than pleased to send you. Address our nearest office or, if more convenient, write us direct.

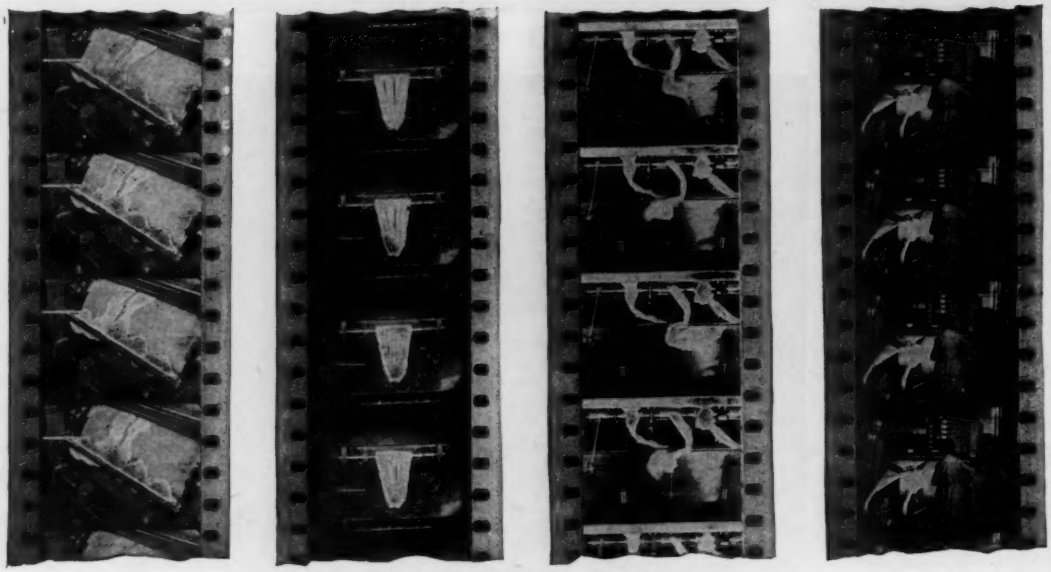
THE STAFFORD COMPANY

Weaving Machinery

READVILLE, MASS.

Southern Agent—Fred H. White, Charlotte, N. C.
Branch Office—502 Colt Bldg., Paterson, N. J.

Canadian Representatives—
Whitehead, Emmans, Ltd., Montreal.



Seeing Thirsty Cotton with Movies

We've been telling you for some time of the loss from allowing your cotton to become thirsty.

All the manufacturing operations in a cotton mill tend to make it thirstier as it goes through until at the time of shipment its thirst may cost you as much as $5.00 a bale. Figures and charts are a cold medium of expression and we have long wished to be able to show in pictures just how and when these losses occur.

Through months of experiment and patient research work we are now able to announce the completion of a scientific film showing direct comparisons of good and bad conditions.

This film is entirely different from the usual industrial film. The pictures are taken close-up and by the ingenious slowing down process combined with magnification one can see the operation and behavior of the fibre during the different processes and just what effect moisture has.

Imagine being able to see a flyer that normally revolves at 900 revolutions per minute photographed as if it were running only 120 revolutions and showing all of the defects due to dry condition of the cotton in the sliver.

Magnification and the slow motion camera provide you with ten times as much eyesight, capable of seeing ten times as fast.

Subject to previous schedule, arrangements may be made to show the film in your locality. Write us.

Parks-Cramer Company

Engineers & Contractors

Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

Right Region

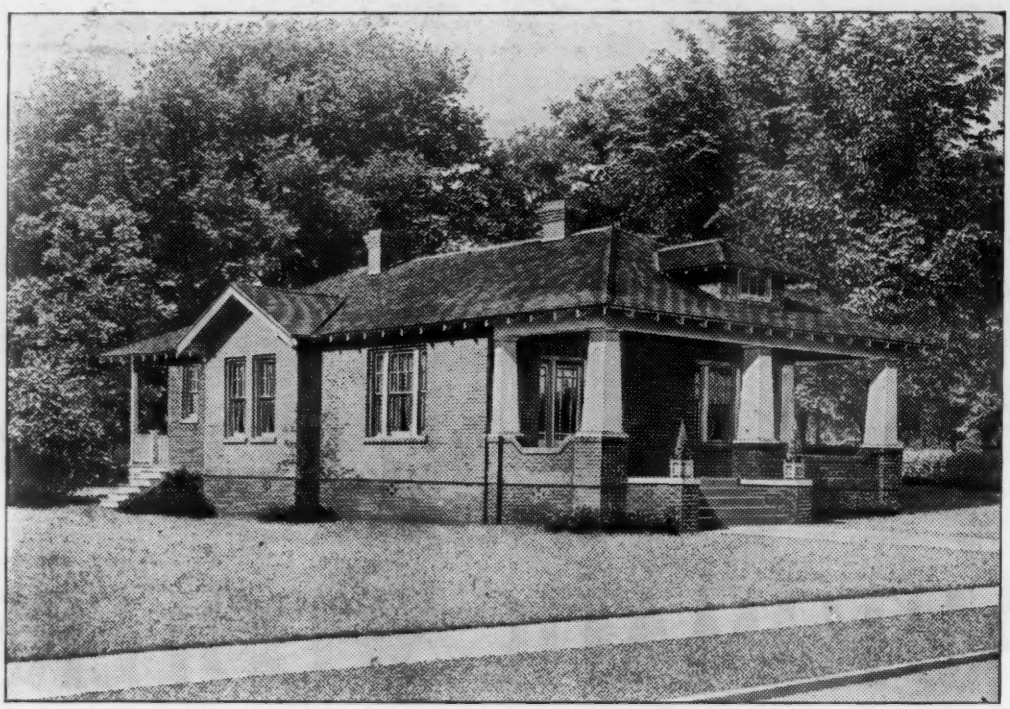
Copyright 1927 P. C. Co.

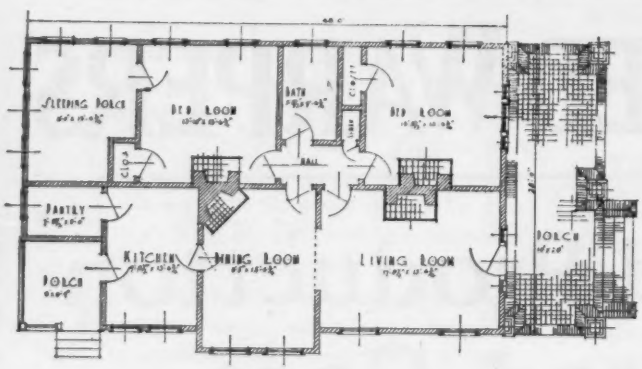
"Every Knot a Weaver's Knot"
with
AUTOMATIC SPOOLERS
HIGH SPEED WARPERS

Increased Production
Lowered Cost
Better Weaving

BARBER-COLMAN COMPANY
BOSTON, MASS. GREENVILLE, S.C.
MAIN OFFICE AND PLANT
ROCKFORD, ILL. U.S.A.

We Handle Every Building Detail





FLOOR PLAN
of the Minter Home Illustrated Above

Type of Minter Home selected for Superintendent's Residence by a leading Textile Firm. Exterior finish of this attractive home may be either brick veneer, as shown, or in wood.

You are delivered completed homes when you place your housing in our hands. Only one contract is necessary.

No matter what your building needs may be—one and two-story community houses, churches, stores, school houses, moving picture theatres, apartment houses or other structures—you can have them erected in exact accordance with your plans or those of your architect without being troubled by any detail.

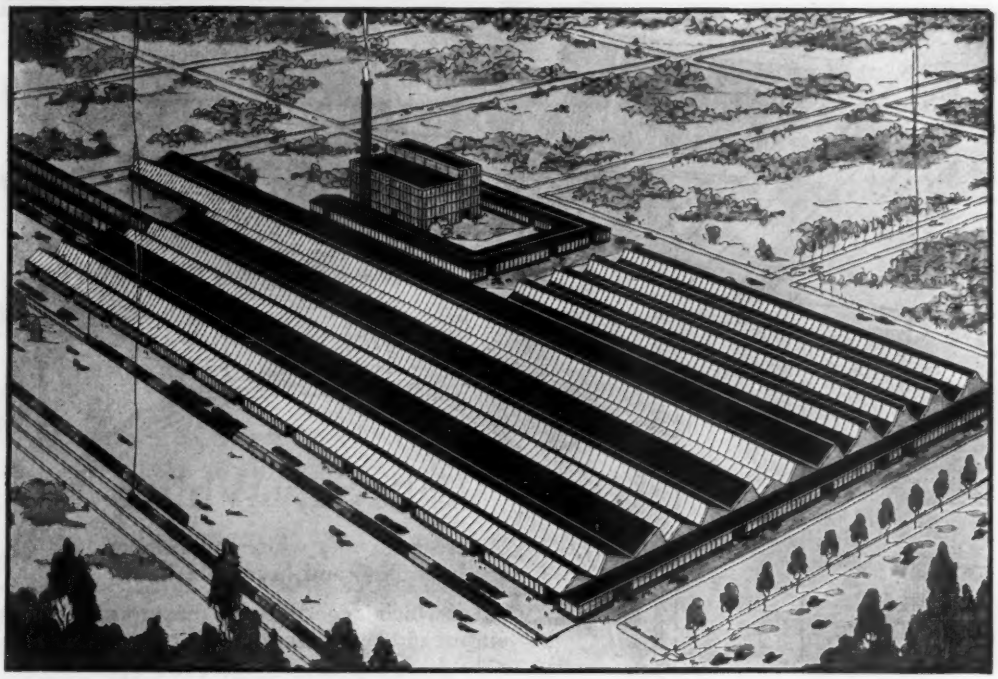
All Minter structures are built of the best materials of the kind specified, are erected in minimum time and without loss of time, labor or materials.

The Minter System is the modern method of building that saves your time, your nerves and the money of you and your stockholders.

Write us today about the houses you need.

THE MINTER HOMES CO.
GREENVILLE, SOUTH CAROLINA

MINTER HOMES CORPORATION
HUNTINGTON, WEST VIRGINIA



Why JEWETT chose a Viskalt roof

PERMANENT weather protection through years of hard service. That was the main requirement demanded of the roof for the new Jewett automobile plant. And upon the facts proved by careful, scientific investigation a Viskalt Membrane Roof was chosen for this huge building.

How long an applied roofing will last depends, as you know, upon the quality of its felt base and that of the waterproofing used on it.

The inner foundation of Viskalt Membrane Roofs is Richardson felt, which has excelled for more than half a century. Maximum absorptive capacity, great tensile strength, unusual pliancy and certain uniformity—these qualities make of it the ideal long-wearing waterproofing base.

And the waterproofing for this sturdy foundation is Viskalt—a 99.8% pure bitumen, especially vacuum-processed to give a degree of permanence hitherto unknown. Exacting tests show that under every strain of temperature, weathering, tension and pressure this remarkable waterproofing remains pliant, adhesive and impervious to water.

These factors which combine to insure years of care-free endurance, plus moderate cost of application, make a Viskalt Membrane Roof doubly economical and satisfactory. Fifty-five years of manufacturing experience are back of the materials it contains. And remember, there is a Viskalt Compound for every waterproofing need.

Let us send you an interesting pamphlet containing valuable roofing information and complete specifications. Just use the coupon below.

The RICHARDSON COMPANY
Lockland (Cincinnati) Ohio

Chicago New Orleans New York City
Atlanta Dallas

THE new Jewett plant just completed by the Paige-Detroit Motor Car Company, Detroit, Michigan, is said to be the largest and most modern in construction and equipment in the automobile industry. Its capacity is 500 cars a day. Special care was given to the design of the roof which is of advanced saw-tooth construction.

That the architect, Albert Kahn, who has designed most of the automobile plants in Detroit, and the officials of the Jewett plant, chose a Viskalt Membrane Roof after careful investigation, shows how generally Viskalt is recognized as the logical covering for industrial buildings. In Detroit alone, there are about forty acres of Viskalt Membrane Roofs.

RICHARDSON
Viskalt Membrane ROOFS

PLIANT UNDER STRESS

The Richardson Company
Construction Materials Division
Dept 44-M, 1008 Fisk Bldg.,
New York City
Gentlemen: Please send me your pamphlet of specifications for Viskalt Membrane Roofs.

Name.....

Address.....

.....

1924, The Richardson Company

Walls Stay Whiter

Where walls stay whiter, workrooms are brighter - - and hearts are lighter.

All of which is conducive to maximum output and better work.

The staying quality of OJACO Mill White is a demonstrable, proven fact where ample daylight is a factor in speeding production and reducing lighting costs.

Because it so *permanently* retains its whiteness, OJACO Mill White is in growing demand among progressive textile mills and factories.

Oliver Johnson & Co., Inc.

Makers of Paints for all Industrial Purposes

18-24 Custom House St., Providence

Established 1833

OJACO

MILL WHITE

Distributors

BOSTON, MASS. Lewis E. Tracy Co.
FALL RIVER, MASS. Wm. F. Harticon
HOLYOKE, MASS. J. Russell & Co.
SYRACUSE, N. Y. Alexander Grant's Sons Co.
CHARLOTTE, N. C. Charlotte Supply Co.
GREENVILLE, S. C. Frank R. Henry & Co.
ROCHESTER, N. Y. E. P. Van Hosen Co.
UTICA, N. Y. American Hard Wall Plaster Co
WOONSOCKET, R. I. Pinault & Choquette

We saved a client $400,000 because we were able to give him *complete* engineering service

It was an old mill. Additions had been made from time to time. Its owners discovered that power and fuel were eating up their profits. They were considering plans for a power plant that would cost $500,000, when we were called in.

Our engineers did not stop at the power plant. They made a thorough study covering every foot of ground and every manufacturing process. It was found that large quantities of hot water were being discharged into the river from two condensers. At the opposite end of the plant, a large volume of cold water was being taken from the river and heated with live steam from the boilers, for use in the dye house. By an odd coincidence, the amount of water available from the condensers was exactly equal to the amount needed.

Our engineers devised a plan for utilizing the hot water from the condensers for use in the dye house, instead of wasting it in the river. This improvement, with the installation of new equipment, alterations and repairs to buildings, cost less than $100,000, a saving to the client of over $400,000. Moreover, the improvements made possible a reduction of boiler capacity, with a resultant saving of 25 per cent, in the yearly fuel bill.

In the solution of this problem, Lockwood-Greene engineers had the advantage of extensive experience in textile manufacturing. They pictured the complete mill as a unit, with the power plant in its proper relation to every other department, while under the original plan, the power plant was treated as a separate unit without regard to the rest of the mill.

This is just one example of the completeness of Lockwood-Greene service. "Building with Foresight," a booklet showing similar examples of Lockwood-Greene achievements, is free to you. Write for it.

LOCKWOOD, GREENE & CO.

ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, BOSTON

BOSTON NEW YORK CHICAGO

DETROIT ATLANTA CLEVELAND CHARLOTTE SPARTANBURG

Lockwood, Greene & Co. of Canada, Limited, Montreal

Compagnie Lockwood Greene, Paris, France

THE FUNCTIONS OF THE ENGINEER

TO REDUCE THE COST OF POWER

POWER costs money, and loss of power means increased cost per unit of power. How to reduce the cost of power with your present equipment, may be your problem.

Utilizing available water power by the construction of a hydro-electric plant is often a warranted investment yielding returns in greater power at lower cost per unit. Similarly, it frequently pays to modernize and re-equip an old plant.

The frequent harnessing of the same river with a group of plants, one below the other, has been successfully accomplished, and in some cases the same streams have been made to operate a dozen or more power plants.

The services of the Engineer are required to determine the feasibilities of such undertakings, as well as to study other vital factors.

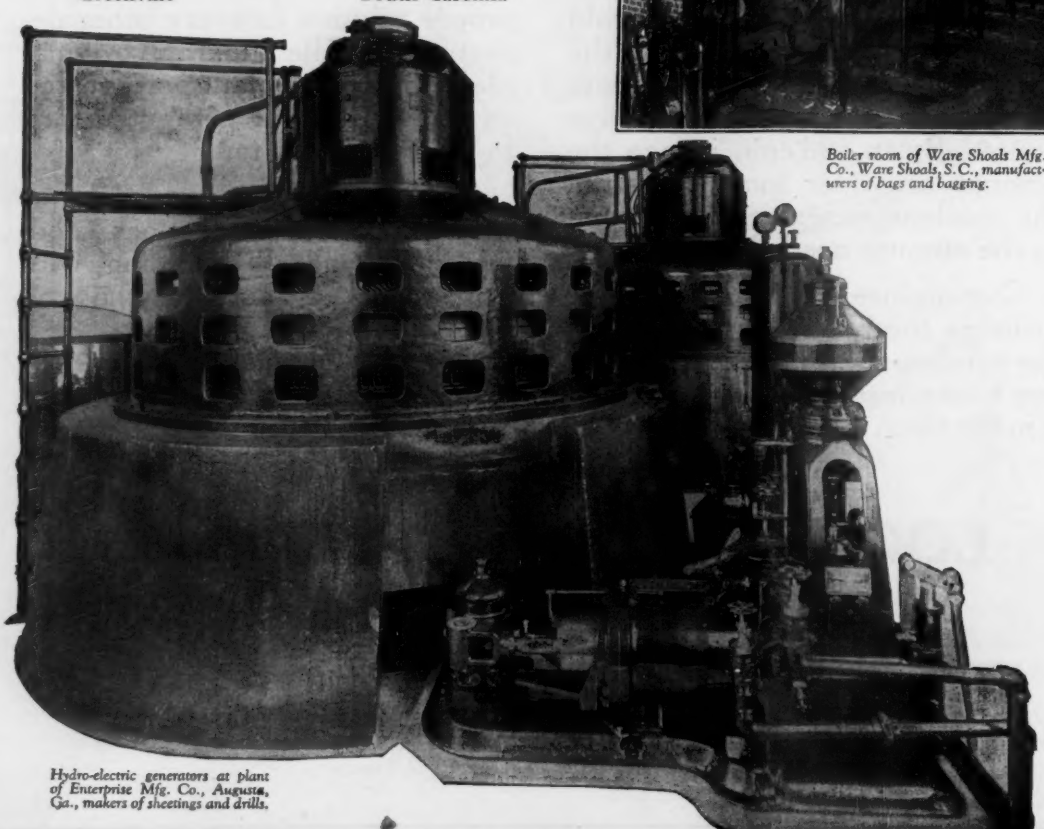
You will find "Rivers in Harness"—a description of hydro-electric possibilities and "Getting the Most out of Steam," will interest you. They are worth writing for; or if you wish, a member of this organization will confer with you. This involves no obligation.

J. E. SIRRINE & COMPANY

Engineers

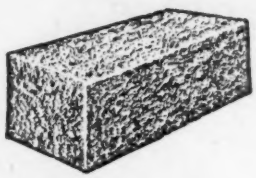
Greenville South Carolina

Boiler room of Ware Shoals Mfg. Co., Ware Shoals, S. C., manufacturers of bags and bagging.



Hydro-electric generators at plant of Enterprise Mfg. Co., Augusta, Ga., makers of sheetings and drills.

The FOLLY OF PENNY-WISE PAVEMENTS



Albion Shale Brick Company
Albion, Ill.
Alton Brick Company
Alton, Ill.
Barr Clay Company
Streator, Ill.
Binghamton Brick Company
Binghamton, N. Y.
Cleveland Brick & Clay Company
Cleveland, Ohio
Clydesdale Brick & Stone Co.
Pittsburgh, Pa.
Coffeyville Vitrified Brick & Tile Co.
Coffeyville, Kans.
Collinwood Shale Brick Company
Cleveland, Ohio
Corry Brick & Tile Company
Corry, Pa.
Francis Vitric Brick Company
Boynton, Okla.
Georgia Vitrified Brick & Clay Co.
Augusta, Ga.
Globe Brick Company
East Liverpool, Ohio
Hammond Fire Brick Company
Fairmont, W. Va.
Hocking Valley BrickCompany
Columbus, Ohio
Independence Paving Brick Co.
Independence, Kans.
Mack Mfg. Company
Wheeling, W. Va.
C. P. Mayer Brick Company
Bridgeville, Pa.
Medal Paving Brick Company
Cleveland, Ohio
Metropolis Paving Brick Co.
Pittsburg, Kans.
Metropolitan Paving Brick Co.
Canton, Ohio
Mineral Wells Paving Brick Co.
Mineral Wells, Texas
Moberly Paving Brick Company
Moberly, Mo.
Murphysboro Paving Brick Co.
Murphysboro, Ill.
Patton Clay Mfg. Company
Patton, Pa.
Peebles Paving Brick Company
Portsmouth, Ohio
Pittsburg Paving Brick Company
Pittsburg, Kansas
Purington Paving Brick Company
Galesburg, Ill.
Southern Clay Mfg. Company
Chattanooga, Tenn.
Springfield Paving Brick Company
Springfield, Ill.
Sterling Brick Company
Olean, N. Y.
Streator Clay Mfg. Company
Streator, Ill.
Thornton Fire Brick Company
Clarksburg, W. Va.
Thurber Brick Company
Ft. Worth, Texas
Toronto Fire Clay Company
Toronto, Ohio
Trinidad Brick & Tile Company
Trinidad, Colo.
Veedersburg Paver Company
Veedersburg, Ind.
Western Shale Products Company
Fort Scott, Kans.
Westport Paving Brick Company
Baltimore, Md.

for **STREETS**
ROADS
DRIVEWAYS
LOADING YARDS
SHOP FLOORS
FACTORY RUNWAYS

YOU can almost always buy some form of hard-surfaced pavement which, *in first cost,* will stand you less than a vitrified brick pavement—but it is rarely good business to buy it.

The *first cost* of a vitrified brick surface is also its *last cost* for many years to follow, while the "cheaper" substitute will soon demand yearly expenditures for upkeep and repairs which will total nearly as much as its first cost.

Many a pavement in use today built of inferior substitutes for brick has already required repair expenses sufficient to construct *two* new brick pavements of equal yardage.

Would you like some evidence from official records illustrating the genuine economy of a vitrified brick paving program? Accurate comparisons prepared by impartial observers will be gladly furnished on request.

NATIONAL PAVING BRICK
MANUFACTURERS ASSOCIATION
ENGINEERS BLDG. CLEVELAND, OHIO

VITRIFIED
Brick
PAVEMENTS
OUTLAST THE BONDS

If It's A Broadside—

If it is an especially large illustration for an especially large piece of literature, chart, birds eye view, map, etc. Whether it be in one or more colors, our plant is equipped to supply your needs. No halftone or line plate too large or too small for our equipment.

Illustrating Your Literature

Sometimes in the preparation of your sales and advertising plans you find the need of some especially prepared piece of literature, the execution of which will baffle your photographer, electrotyper and printer. Frequently you may seek a service that the ordinary plant cannot give.

Our plant is designed and equipped for the accomplishment of many difficult products that cannot be secured from most photo-engraving establishments; is equipped to furnish the best of photo-engraving, electrotyping, printing, nickeltyping, commercial art and allied service, whether large or small, whether one or more colors. The extent of our equipment is reflected in the large process camera, which can furnish you with process color plates as large as a yard square. One of the 6 largest in the world. If you have an idea you wish carried into execution, we are at your service. We will gladly perfect it and illustrate it.

Battery of Cameras in the Photo-Engraving Department
A Close Up View of One of the 6 Largest Color Process Photo-engraving Cameras in the World-Installed in the Photo-engraving Dept. of Jacobs & Co.
General Offices Advertising and Multigraphing
Electrotyping Nickeltyping
Photo Engraving Commercial Art Photography
Fine Arts Printing and Binding

Jacobs & Company
Clinton, S. C.

Advertising, Commercial Art
Photo-Engraving—Electrotyping
Nickeltyping
Color Printing

How Often Do You Paint Your Houses?

Few places where paint is applied in any quantity show more quickly or clearly the wisdom of using good paint than the townsite or village.

The small percentage of additional cost sometimes necessary in order to get proven quality and service in paint is paid back many times over in homes that continue to look new and attractive well beyond the time when it might otherwise be necessary to repaint.

And when you remember how small a part of your painting cost is represented by the price of materials used, you can readily see the saving effected through the use of proven quality that is represented in Degraco Paints.

Eliminate the expense of frequent repaintings --- Degraco Paints will do it.

(226)

DEGRACO PRODUCTS

Superior Graphite Paint
Sta-White
Degraco House Paint and Varnish
Degraco-Tone-*Flat wall finish*
Degraco Brick and Concrete Paint
Anti-Aqua-*Damp-proof coating*
Degraco Gas Holder Paint
Degracolin-*Concrete floor hardener*
Degraco Enamels
Industrial Finishes

DEGRACO PAINTS

All Colors for Your Particular Needs

MADE BY

Detroit Graphite Company

517 Twelfth Street

Manufactured in Canada by Dominion Paint Works, Limited, Walkerville, Canada.

DETROIT U.S.A.

DEGRACO PAINTS are sold through branch offices with warehouse stocks in all principal cities.

MORSE SILENT CHAIN DRIVES

The installation shown here admirably illustrates how a Morse Silent Chain Drive is saving space in a Southern Knitting Mill.

Saving Valuable Space

The motor, chain and casing are mounted on a stand and occupy a surprisingly small space on one side of the line shaft only.

In addition, this method of installation has the following distinct advantages:

Makes Room Cleaner

The elevated mounting precludes dust and lint adhering to base of motor.

Gives Better Arc of Contact

Because the small sprocket is higher than the large sprocket.

Reduces Fire Hazard

By preventing oil soaked floors.

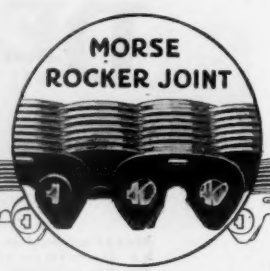
These advantages, coupled with the fact that Morse Chains transmit 98.6% of power developed, demonstrate its efficiency in providing smooth continual operation of the spindles at constant speed, with the minimum of upkeep.

Permit Morse Engineers to prepare a drive that will solve your transmission problems to your entire satisfaction.

MORSE CHAIN CO., ITHACA, N. Y.

There is a Morse Engineer near you

ATLANTA, GA...702 Candler Bldg., Earl F. Scott & Co.
BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk Street
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Room 803, 112 West Adams Street
CLEVELAND, OHIO.....421 Engineers Bldg.
DENVER, COLO.....1761 Wazee St., R. M. Parsons
DETROIT, MICH.....7601 Central Ave.
KANSAS CITY, MO.....Finance Bldg., Morse Eng. Co.
NEW YORK CITY.....Room 1871, 50 Church St.
MINNEAPOLIS, MINN.
413 Third Street, Strong-Scott Mfg. Co.
MONTREAL, QUE., CAN.
St. Nicholas Bldg., Jones & Glassco Reg'd.
PHILADELPHIA, PA.....617 Franklin Trust Bldg.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng. Co.
TORONTO, ONT., CAN.
Bank of Hamilton Bldg., Jones & Glassco Reg'd.
WINNIPEG, MAN., CAN.
Dufferin St., Strong-Scott Mfg. Co.



2048-30

"-is automatic in every sense of the word."

Highland Park Manufacturing Co.
MANUFACTURERS OF
COTTON GOODS.
Charlotte, N. C. Feb. 22, 1924.

(Name furnished upon request)

We are advised by Mr. Irwin of the Reeves Pulley Co., that you are investigating the variable speed transmission with automatic control. We beg to say, that we have one of these calender and tentering machines, tending range between calender and tentering machines, and we find the same to be entirely satisfactory in every respect. We have placed our order for another one of these machines to be used in another tenter s range which we have.

The machine which we have is "THE REEVES" No. 5-G with Automatic Control and ball bearing throughout. The automatic control is connected through chains and pulleys with a floating roll of the compensator which is placed between the tenter and calender. The action of this floating roll, up or down, increases or decreases the speed of the tenter as required, so as to maintain uniform tension at this point.

We have never had to touch this control since we put it in operation and we can not speak too highly of it for this purpose. We have been using REEVES hand control transmission for a number of years, at various places, throughout our finishing plant, but in the future wherever we have to install one of these machines, we shall certainly use the automatic control, as the same is automatic in every sense of the word.

Very truly,
HIGHLAND PARK MANUFACTURING CO.
By J. S. Williamson

JSW/o

"The Reeves" Automatic Control

has brought about a wonderful advancement in the method of finishing cloth in textile mills. It makes possible the range system of cloth finishing.

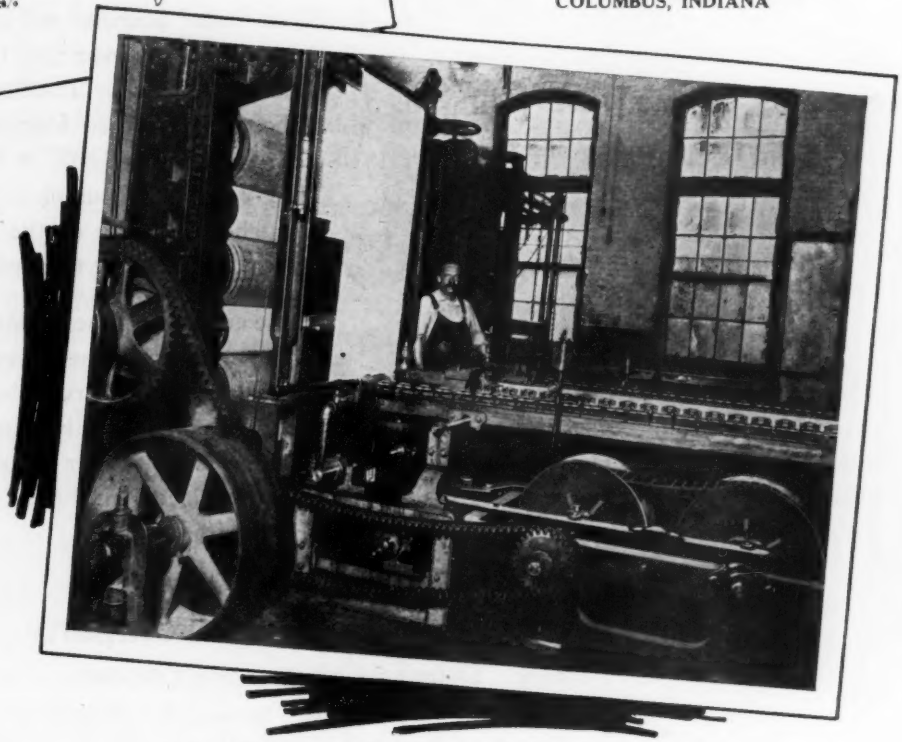
"The Reeves" Automatic Control is ABSOLUTELY AUTOMATIC in that when once connected it never has to be touched or watched—never gets out of adjustment or balance, never fails to operate, always keeps the tension of the cloth uniform. It is so positive in its automatic regulation that there is absolutely no "hunting" whatever of the floating roll—it moves to its proper position and there it stops.

When the speed of the "master" or hand controlled machine in the range is varied, all other machines automatically vary with it and simultaneously holds the tension on the fabric uniform.

Is extremely simple, durable and reliable. Very inexpensive and easily installed. No electrical apparatus or complicated switches to get out of order. It is absolutely foolproof.

Write for Automatic Control Bulletin, C-2055.

REEVES PULLEY COMPANY
COLUMBUS, INDIANA



No. 5-G REEVES Variable Speed Transmission with Automatic Control operating 90' Tentering machine through Morse chain connection. The Transmission automatically controls the speed of the tenter and keeps the tension of the cloth uniform between tenter and calender. Speeds 40 to 80 yards per minute.

Entire line of machines furnished by H. G. Mayer, Southern Representative of Textile Finishing Machinery Co., Charlotte, N. C.

Proof of Economies Effected By Hyatt Bearing Spinning Frames

Spinning Frame Test Mill No. 1

Plain Bearings	4.91 HP
Hyatt Bearings	4.37 HP
Saving per frame	.54 HP

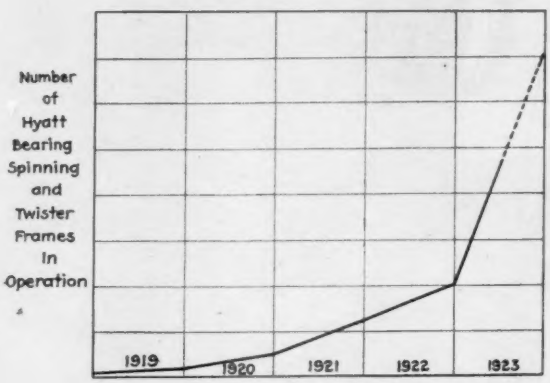
Spinning Frame Test Mill No. 2

Plain Bearings	5.46 HP
Hyatt Bearings	5.00 HP
Saving per frame	.46 HP

Spinning Frame Test Mill No. 3

Plain Bearings	4.37 HP
Hyatt Bearings	3.84 HP
Saving per frame	.53 HP

The above tests, run in mills under actual operating conditions, show that an average power saving of .51 HP per frame was effected by replacing ordinary bearings with Hyatt roller bearings.



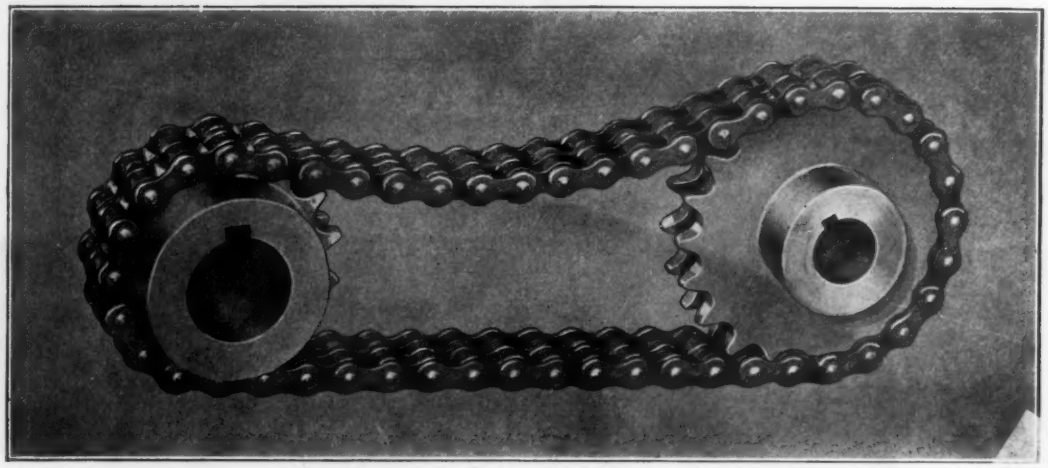
Hyatt roller bearings not only reduce friction and save power but they also reduce maintenance costs. The bearings need only to be oiled three or four times a year, effecting a saving of 80% in lubrication costs. They cannot get out of order and will last throughout the life of the spinning frames without adjustment or replacement.

These are some of the reasons why successful mill operators who are ever on the alert for ways and means for reducing operating costs are specifying Hyatt bearings for their new spinning and twister frames and having Hyatt replacement boxes applied to their present frames.

Hyatt Roller Bearing Company

Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington Minneapolis Philadelphia
Cleveland Pittsburgh Buffalo Indianapolis



DIAMOND High Speed Roller Chains

for Motor Drives and Textile Machinery

DIAMOND Roller Chains and Sprockets make ideal power transmission units for drives from electric motors to machines, and for auxiliary drives on a wide range of textile machinery.

Years of service in many important industries have demonstrated that these drives are well adapted to high speeds and heavy loads, and will operate successfully under severe conditions.

They transmit power positively, flexibly and efficiently, run smoothly and quietly and operate on short centers—saving valuable space. Their long life, with practically no up-keep expense beyond lubrication, reduces the yearly cost of each drive to a low figure.

If you have a power transmission problem of any kind, send us your specifications and let our engineers recommend the correct drive for your conditions. You will incur no obligation and we may be able to save you considerable money.

The DIAMOND Trade Mark

Look for this mark of quality on chains and sprockets. It is backed by 34 years of wide experience.

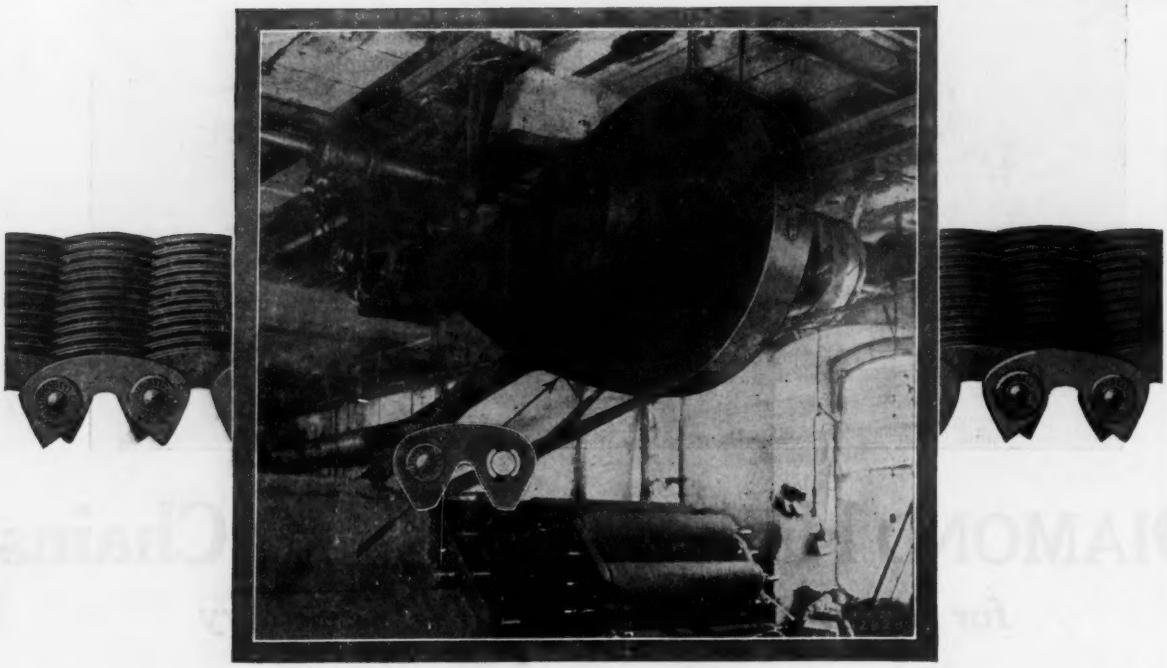
Catalog and Data Sheets

Every mill executive should have these on file. You'll find them of real help. Write us for copies.

DIAMOND CHAIN & MFG. CO. Indianapolis, U.S.A.

Makers of High Grade TRADE MARK *Chains Since 1890*

DIAMOND
Roller Chains



Link-Belt Silent Chain Drives Are Far Superior——

SAYS Robert Calhoun, Chief Engineer of the John & James Dobson, Inc., Philadelphia, Pa., when commenting on their power transmission installations.

He goes on to say:

"In many ways Link-Belt Silent Chain Drives prove their superiority. One is the short distance possible between centers. Our motors for the spinning frames are set in windows, the distance between centers being 3′-6″. Belts would require 8′ to 10′ and we have not the space to waste.

"Another advantage is the positiveness of the drive. Absolutely no slippage—and usually an increase in production is characteristic of Link-Belt Silent Chain.

"Breakdowns or layups due to the drive are unknown and we have been operating them steadily since 1914".

Mr. Calhoun's experience with various types of power transmission is an interesting story. We have it in printed, illustrated form. Send for a copy of report No. 49. Also send for a copy of Link-Belt Silent Chain Data Book No. 125.

Other Link-Belt Products

Elevators and Conveyors
Coal and Ashes Handling Systems
Locomotive Cranes
Crawler Cranes
Electric Hoists
Belt Conveyors
Skip Hoists
Portable Loaders
Transmission Machinery
Chains, Wheels
Buckets, Gears

Send for Catalogs.

1527

LINK-BELT COMPANY

PHILADELPHIA, 2045 Hunting Park Ave. CHICAGO, 300 W. Pershing Road INDIANAPOLIS, P. O. Box 85

New York - - - - 2676 Woolworth Bldg.
Boston - - - - - - - - 49 Federal St.
Pittsburgh - - - - - - - 335 Fifth Ave.
St. Louis - - - - - - - 705 Olive St.
Buffalo - - - - - - 745 Ellicott Square
Wilkes-Barre 826 Second Nat'l Bank Bldg.
Huntington, W. Va. Robson-Prichard Bldg.
Cleveland - - - - - 329 Rockefeller Bldg.
Detroit - - - - - - 4222 Woodward Ave.
Kansas City, Mo. - - - 307 Elmhurst Bldg.
Denver - - - - - - - 520 Boston Bldg.
Atlanta - - - - - - - - 24 Marietta St.
Louisville, Ky. - - - - 321 Starks Bldg.
Birmingham, Ala. 720 Brown-Marx Bldg.
New Orleans - 504 Carondelet Bldg.
New Orleans - - - - - -
Whitney Supply Co., Ltd., 418 S. Peters St.
Charlotte, N. C., - - - - -
J. S. Cothran, 909 Com'l Bank Bldg.
Link-Belt Limited Toronto and Montreal

H. W. CALDWELL & SON CO.:—Chicago, 1700 So. Western Ave.; New York, 2676 Woolworth Bldg.; Dallas, Texas, 810 Main St.

LINK-BELT MEESE & GOTTFRIED CO.:—San Francisco, 19th and Harrison Sts.; Los Angeles, 400 E. Third St.; Seattle, 820 First Ave. S.; Portland, Ore., 67 Front St.

LINK-BELT
SILENT CHAIN DRIVES

Strom BALL BEARINGS

What this trade-mark on a Ball Bearing means to you—

A STROM trade-mark on a ball bearing means that

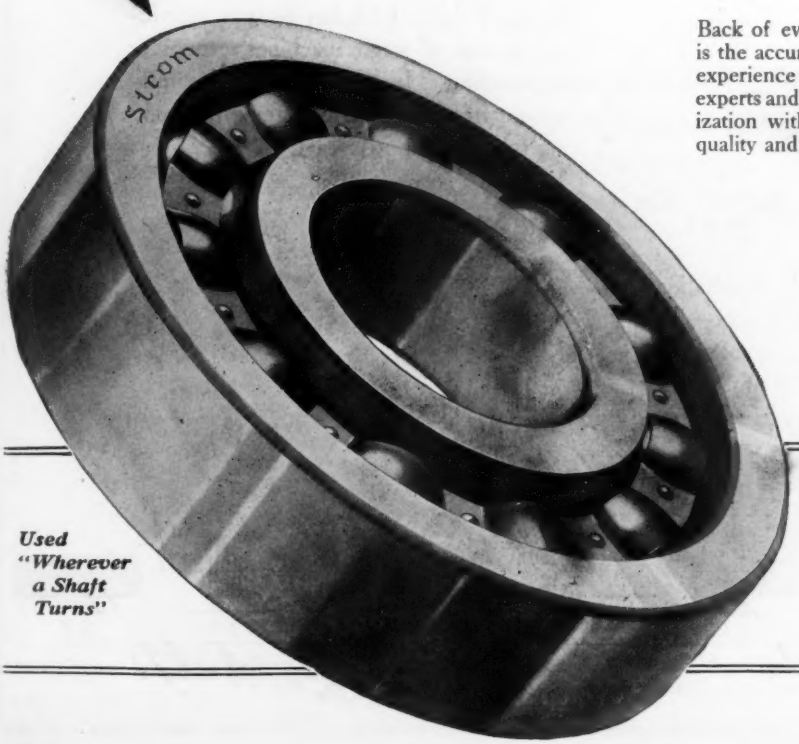
—You are getting a bearing which is the first choice of leading engineers in all industries.

—You are getting a bearing which is correctly designed to carry the load and reduce friction to a minimum.

—You are getting a bearing made of special ball bearing steel, heat-treated by the most modern and approved methods (not merely case-hardened).

—You are getting a bearing which is made by skilled workmen in a modern plant and rigidly inspected in every step of its manufacture.

—You have at your disposal—always—all the resources of this great institution devoted solely to manufacturing high-grade ball bearings.



Back of every Strom ball bearing is the accumulated knowledge and experience of a staff of engineering experts and a manufacturing organization with the highest ideals of quality and service.

We offer

—Expert engineering assistance.

—A wide variety of types of ball bearings for all purposes.

—Prompt delivery from stock on standard sizes.

—Our catalog No. 8, giving dimensions and load carrying capacities of Strom ball bearings, as well as other ball bearing literature.

Used "Wherever a Shaft Turns"

U. S. Ball Bearing Mfg. Co.
4544 Palmer St., Chicago, Ill.

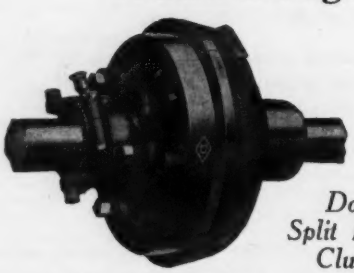
The power you pay for *Productive power*

Is this true in your mill?

The power generated in your boiler room is what you pay for, but the power actually delivered to the machinery of production in your mill is what determines whether your power costs are low, moderate or excessive.

If you have idle machines producing part of the time, but consuming power all of the time, your power system is out of step and your costs are higher than necessary.

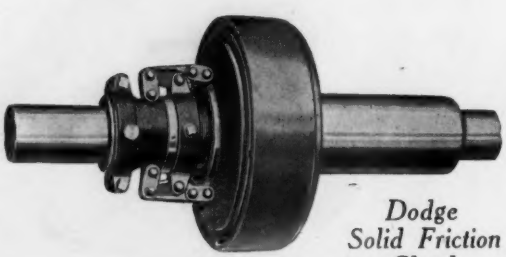
Thousands of Manufacturers have found Dodge Clutches a paying investment



Dodge Split Friction Clutches

Dodge Friction Clutches provide individual control of single machines, groups or departments. Idle machines are instantly cut out from the general system, thus making substantial power savings.

A Dodge Friction Clutch installation represents a moderate investment—the power savings in thousands of cases have paid the bill during the first year. Send for our literature and further information.



Dodge Solid Friction Clutch

DODGE MANUFACTURING CORPORATION

General Offices: Mishawaka, Ind. *Works:* Mishawaka, Ind., and Oneida, N. Y.

EVERYTHING FOR THE MECHANICAL TRANSMISSION OF

Branches: New York Philadelphia Pittsburgh Boston Cincinnati Newark Chicago Atlanta Minneapolis St. Louis Houston Seattle San Francisco

Power

HYATT BEARING DURABILITY

Long Life as Evidence

Long life proves durability. In hundreds of plants Hyatt line shaft roller bearings have been operating for years—with no trouble and little care.

Such durability is possible because of correct mechanical design and a feature found in no other type—the hollow, flexible roller. This flexibility means full line contact—means that the roller adapts itself to the irregularities of the shaft, insuring at all times an even distribution of the load, reducing wear to a minimum.

Evidence on Hyatt Durability from manufacturers you know and new bulletin describing the bearing of the highest practical efficiency, sent upon request.

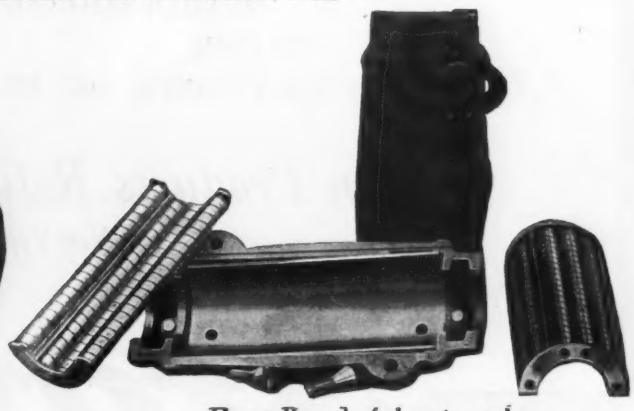
'Phone The Nearest Mill Supply Dealer

HYATT ROLLER BEARING COMPANY

NEWARK, NEW JERSEY

PACIFIC COAST ADDRESS: SAN FRANCISCO, CAL.

Phantom view of Hyatt line shaft bearing, showing rollers and cage in place.



Hyatt line shaft bearing taken apart. Simple construction, split and easy to install.

Starch

EFFICIENCY and ECONOMY are the watchwords today. Modern mill men who hold to this motto are discarding ordinary, imperfectly refined starches and selecting those special types best suited for their individual conditions.

Some desire increased weight, all need increased strength and better weaving qualities for the warp.

You know the result you seek.

We know and can provide the proper type of starch.

400 MILL

500 MILL

FAMOUS N

C. P. SPECIAL

BLUE RIVER CRYSTAL

BLEACHING and FINISHING PLANTS have learned that "any old" STARCH or DEXTRINE will not do the work. To secure the proper "feel," the desired weight and the attractive finish, careful discrimination must be exercised in selecting

STARCHES and DEXTRINES

We manufacture all approved varieties

90 THIN BOILING CRYSTAL

162 GUM 163 GUM

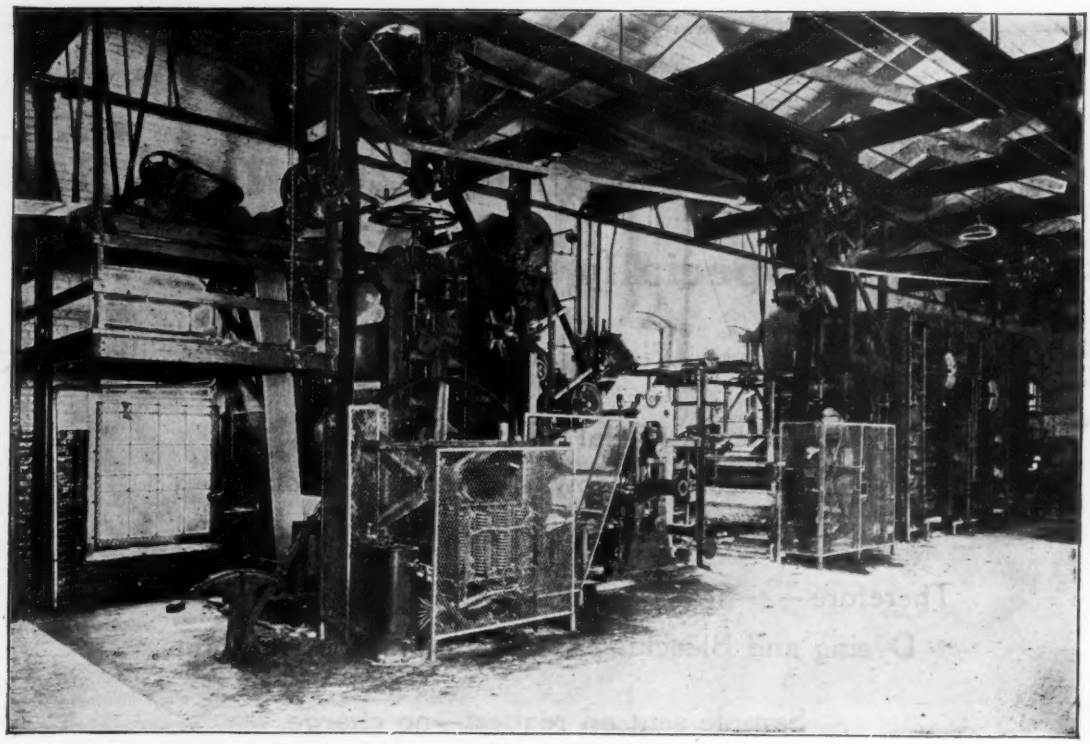
DEXTRINES and BRITISH GUMS

Corn Products Refining Company

New York

Southern Office *Greenville, S. C.*

Starch



What does it cost to put finishing machinery in range
—and how much will it save yearly?

If many textile manufacturers and finishers had the answer to this question in connection with their own individual plants, they wouldn't hesitate a minute in putting practically all their machinery in range.

We have often seen cases where with machinery in range three men have done the work which formerly required 12 men.

Then there is the saving in seconds and stop-and-start waste.

Whenever you are ready, we will be very glad to take up the question of putting your finishing machinery in range.

H. W. BUTTERWORTH & SONS CO.

Canadian Representative:
W. J. Westaway Co
Hamilton, Ontario, Canada

Greenville, S. C., Office:
Woodside Building.

Providence Office:
Turk's Head Building.

BUTTERWORTH *Finishing* MACHINERY

Hydroxy Art Silk Coning Oil

A Specially Prepared Oil

Used in the Coning, Winding, and Knitting of Artificial Silk

Makes Artificial Silk Knit Smoothly.
Eliminates Breakdowns. Reduces Seconds.
Washes out easily at low temperature.

Therefore—
Dyeing and Bleaching is even and shades brighter.

Sample sent on request—no charge.

Developene (There Is no "Just as Good")

Makes a rusty Black stocking turn deep Black.

Kali Chlorine Neutralizer

An Anti-chlor—prevents tender bleached goods.

All chemicals for the Dye House—
All oils—Sulphonated—Turkey Red—
Neatsfoot, Olive, etc.

KALI MANUFACTURING CO.

1410 No. Front St., Philadelphia, Pa.

Sole Manufacturers of "Hydroxy Oils" Patented.

THE UNITED STATES FINISHING COMPANY

BLEACHERS, MERCERIZERS, DYERS, PRINTERS
AND FINISHERS OF COTTON PIECE GOODS

GENERAL OFFICES

320 BROADWAY, NEW YORK

WORKS
NORWICH, CONN.
STERLING, CONN.
PAWTUCKET, R. I.
PROVIDENCE, R. I.
CEDARTOWN, GA.

QUEEN DYEING CO.
PROVIDENCE, R. I.

HENRY B. THOMPSON, President
JOHN G. BAUSHER, Vice President
HARRY M. HORTON, Vice President
ANDREW C. IMBRIE, Treasurer
GRANT A. McCLATCHIE, Secretary
WILLIAM T. JOYCE, General Manager

Annual Capacity
Three Hundred and Fifty Million Yards

Our new branch at Cedartown, Ga., opened in January, 1924, is well situated and equipped to handle:

Sulphur-Dyed Twills, Drills, Ducks and Sheetings for the work-clothing trade; and wide fabrics for the automobile and artificial leather trade.

WHAT DYE SERVICE DO YOU WANT?

"NATIONAL" Service is founded on a trained sales organization and a practical service staff. Both are thoroughly informed on the properties and the application of National Dyes. Both are competent to assist in the solution of your coloring problems.

National Aniline & Chemical Company, Inc.
40 Rector Street, New York, N.Y.

Boston	Philadelphia	San Francisco
Providence	Chicago	Montreal
Hartford	Charlotte	Toronto

"NATIONAL" DYES
FOR TEXTILES

NATIONAL N DYES

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. R. W. PHILIP, Associate Editor.

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $3.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Volume 88

Member Associated Business Papers, Inc.
Member Audit Bureau of Circulation.

No. 6

CONTENTS

Editorial—

How Good May Come From Scandal 551
Henry Ford and Muscle Shoals 552
Taxes You Pay Without Knowing It 552
Can the Law of Supply and Demand Be Repealed? 552

General and Technical—

Pension Systems—Sound and Unsound 553
Determining Yarn Costs 556
Intangibles in Manufacturing 564
Fall River Operating Executives Hold Section Meeting on Spinning and Weaving 565
Human Relationships in Industry 569
Textile Operating Executives of Georgia Hold Spring Meeting in Atlanta 573
Machine Calico Printing 584
Towels and Toweling 588
What the Southern Mills Are Doing 590
The New England Mill Situation 592
Cotton Comment 595
Notes About Men You Know 598
An Old-Timer Says 601

How Other Men Manage—

How is Dust Room Capacity Figured?..... 603
The Loom Trouble Rectified 603
To Degum Ramie or China Grass 603
"The Man Who Knows Why" 603
Discussing the High Twist of Contributor No. 13 605
Interesting Weave Room Inquiries 606
"Lay Off" the Tension Gears 606
Apportioning Work per Operative 609
Care of Intermediate and Jack Frames 609
Bleaching Goods for Rubber Plants 611
The Proper Speed for Card Grinding 611
To Prevent Waste on Short Chain Beaming 616
Rules for Cleaning the Spinning Room 616
Wishes Some Discussion on Cone Winding 616
The Sliver Lap Machine 619
Some Suggestions on Drafts 619
Will Card Flats Fly Off? 621
The Discussion on Fly Frames 621
Textile Schools Deserve Greater Support 625
Measuring Roll Settings 627
Reasons for Decrease in Mules 627
Little Things in the Spinning Room 628

Knitting Section—

Air Conditioning Practice in Cotton Mills 631
Among the Knitting Mills 637
Bleaching Underwear Fabrics 639
Fancy Tops on Golf Stockings 639
The Value of Keeping a Notebook 639
A Kink on Knots 641
Keeping a Check on Out-of-Order Machine 643
Solving a Looper Difficulty 643
Some Questions on Average Costs 643
The Yarn Market 644
The Knit Goods Market 647

MATHIESON Chemicals

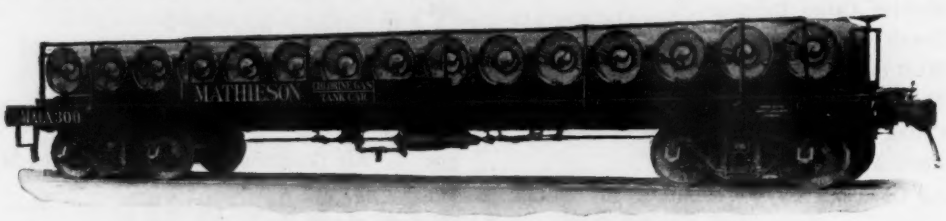
Can You Read Between the Lines?

THE Mathieson Multi-Unit Chlorine Tank Car has been approved by the Interstate Commerce Commission and is now entitled to the same freight rates and privileges as other tank cars. While this decision affects comparatively few Textile Mills, those using fifty tons or more per year in ordinary cylinders can effect a considerable saving in freight charges by taking deliveries in the Multi-Unit Tank Car. All consumers of Liquid Chlorine may read between the lines and find the facts of this case significant.

Over two years ago we voluntarily went to the expense of designing and placing in service the Multi-Unit Tank Car, carrying fifteen one-ton containers of Liquid Chlorine instead of one fifteen-ton tank. Upon refusal of the railroad companies to allow us tank car rates, we appealed to the Interstate Commerce Commission for removal of this discrimination, and continued making shipments in this specially-designed car.

We have assumed all excess freight charges on every movement of the Multi-Unit Car and during the past two years have paid out over two hundred thousand dollars in this way in order that consumers and the general public might enjoy the many advantages realized in this type of equipment. The recent ruling of the Commission awards us full reparations with interest and completely vindicates our faith in the Multi-Unit "Safety First" principle.

The story of the Mathieson Multi-Unit Tank Car is an outstanding example of the leadership we have assumed in the Chlorine Industry. Our policy of superior service covers any quantity from a cylinder to a tank car.



The MATHIESON ALKALI WORKS *Inc.*
25 WEST 43rd STREET NEW YORK CITY

PHILADELPHIA
PROVIDENCE

CHICAGO
CHARLOTTE

EAGLE THISTLE PRODUCTS

Deal Direct with the Manufacturer

Bicarbonate of Soda
Liquid Chlorine-Caustic Soda
Sesquicarbonate of Soda
Bleaching Powder-Soda Ash

With the Publishers—

Carrying Potatoes on a Spoon

An old mill man once turned philosopher at an outing where the youngsters were enjoying all kinds of unique contests.

"Don't those races remind you of some of the cotton mill men you know?" he remarked. "Take those youngsters in that potato race, trying to carry a potato on a small spoon, look at those excited ones dropping their potatoes. Isn't that like a mill trying to carry a big production load with small equipment or the wrong organization? It tries to go too fast and down comes everything.

"Then did you notice that sack race?" he continued. "The youngster who won it did it by taking a step at a time carefully.

"And there is a very real and pertinent race, where two boys tried to run with their inside legs tied together. You could write a book about the value of cooperation and not say any more than you could learn while watching the boys who were not working together fall down and often get in the way of others.

"And that greased pig should have been named 'Mill profits,' he gets away so easily."

The cotton industry is not exactly a picnic but the old man's shrewd observations were much to the point. Even if the business cannot be classed as a sport, it is true that the similiarity between the boys and the mill's operating executives is very marked, especially in the race for production and quality. COTTON has been a spectator at a good many such races and one of its objects has been to discover the methods by which some entrants have outdistanced their competitors.

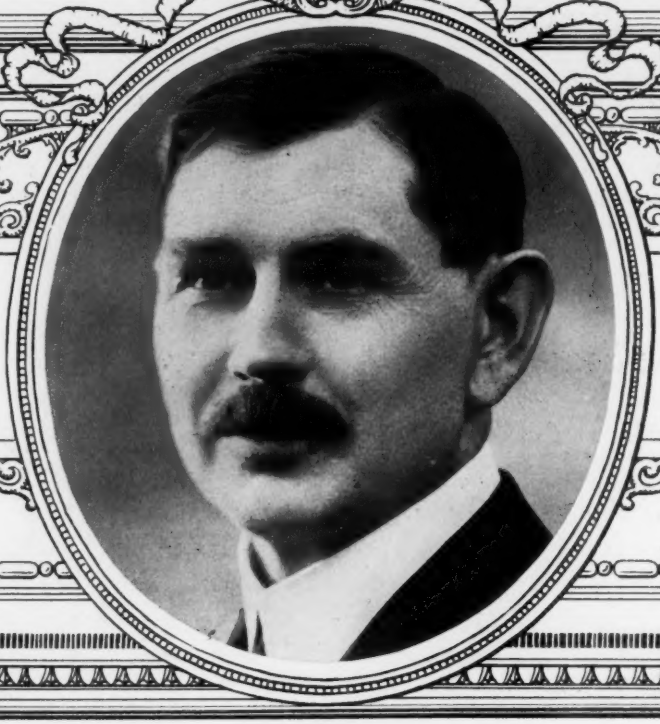
In all cases of success, the winners went in fully equipped, they did not try to carry a potato on a spoon. Before they attempted to make speed they balanced such equipment as they had and installed additional equipment which had shown by past performances that there would be no faltering in the stride when the production race was on. Others have gone "step by step" through the careful study of the methods adopted by other successful plants as described in articles prepared by practical mill men for COTTON. Another group has seen that all the elements in the plant, human and mechanical, were moving together and not jerkily as the legs of many of the contestants in three-legged races are prone to do.

COTTON, too, has in a sense had a share in the awarding of the prizes. The equipment and supplies described in its advertising pages have been a part of the reward of these contestants. Makers of the machinery and devices used in cotton mills have improved and perfected them in recognition of the swifter pace demanded by these leading mills.

And it is these mill owners and managers who do not let the "greased pig" get away. They fully realize the keen competition to be met in present day markets and recognize that it is the little things, the minor differences in methods or equipment, that determine whether the final figures on the balance sheet shall be written in black or red. Because of this keen insight into the advantages of knowing how the other fellow attacks his problems, these men will be found to be careful and habitual readers of the magazines of their trade.

Appreciating the attitude of such men the Editors of COTTON have secured one of the best of these to prepare a series of articles on "What Other Men Manage With." This series will contain many practical suggestions and will, we feel sure, appeal to a wide circle of readers.

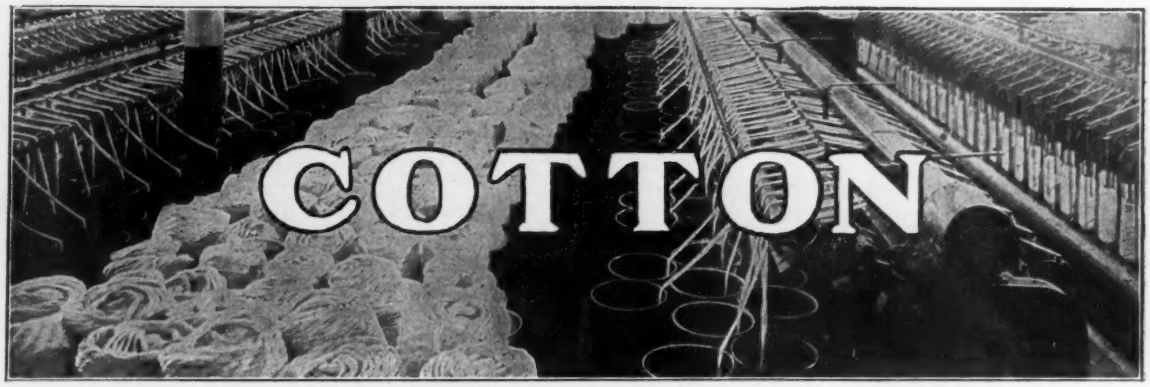
AMONG COTTON'S READERS



Charles E. Miller, Superintendent,
Peerless Insulated Wire & Cable Company,
Pennington, N. J.

"Old-Timer's jabs and advice are good. . .
"I would like to add that I read your magazine regularly and find it a source of inspiration as well as help."

Chas. E. Miller



April, Nineteen-Twenty-Four

How Good May Come From Scandal.

Scandal has been the keynote of news out of Washington during the last several months. Wholesale inefficiency, atrocious waste, culpable malfeasances, apparent criminality have been disclosed on scales beyond what has come forth before during the life of the present generation. Evidently there has been a good deal of exaggeration, considerable playing of politics, much stirring up of clouds of smoke from relatively small flares of flame. But these exposures should fasten public attention on many phases of government which go far beyond incidents of arrant and crude crookedness in office.

Particularly those who believe that government can do anything and can be trusted safely with any kind and volume of power have reason to pause and revise their faith.

The prime source of current scandals anent certain branches of the national government is not, as many believe, the evil which lies in the make-up of men. The prime source and cause of these scandals is the elaboration of government beyond what is either desirable or safe. In fact, one searching studiously for subtle cause might trace it much farther, even to the public itself, or to some curious beliefs which the public more and more has come to entertain.

The basic one of these beliefs is that government can do anything, and that the Federal Government can do it better than any other unit of government.

Another widely prevalent false belief is that risks inhering to the human equation can be eliminated from the operations of government.

Thousands who would be insulted if you called them socialists hold to these beliefs, or, rather, vote them, and frequently voice them otherwise while pretending to think the other way.

It is curious but a fact that the less the average person knows about it the more one believes in an operation of government. This explains in great measure the expansion of the Federal Government. The national government is remote from the body of the people who rarely come in direct contact with it except through the postal service. Many circumstances have contributed to the development of an illusion—which, barring such things as the army and navy and postal service that can be operated only by a central government, is pure illusion—that the Federal Government is little less than Omnipotent. Many people think of it as an organism independent of the frailties and malevolences of men.

Thus elaboration and expansion has been facilitated until in recent years it has reached the point where it is impossible for the big American public to keep apprised concerning the Federal Government's operations. These now are so extended that even persons who give all of their time to following them are ever in considerable ignorance concerning them.

"The legitimate object of government is to do for the people what needs to be done, but which they can not by individual effort do at all, or do as well, for themselves," said Abraham Lincoln.

There isn't much that's beyond individual effort which any government can do, and of that which government can do better than the individual there is very little. Even of these there are only a few things which the Federal Government can do better than local or state government, however patently inefficient these latter may be.

Whatever the Federal or any other government does is the work of individuals, flesh and blood individuals, and not of some ethereal Uncle Sam. The more power granted to the government the greater is made the opportunity for these individuals to err through inefficiency or malevolence. And the more remote the government in which the power is placed, the less likely it is that this erring shall be discovered or, if discovered, be corrected promptly and intelligently.

One needs only to think back for a dozen years, and to review one's recollections of the manifold investigations which have resulted in sensational exposures in Washington, to realize how scarcely a single development of wrong has led to other than added opportunity for its doing. When ventures have wound up in scandal, they usually have been elaborated instead of being abandoned, as should have been done in most cases. It is like curing a disease by spreading it.

What is needed in Washington is not more facilities for the checking of wrong doing but fewer opportunities for wrong being done in the first instance. This calls for less rather than for more government, the curbing of official power instead of increasing it, and the elimination rather than increasing the number of persons who wield such official power.

If the current scandals epidemic should cause public thought to discard the tenet that more government, espe-

cially more Federal Government, is a universal corrective of evils both of government and life great good will be the result.

The actual result, however, probably will be more laws to be abused and more officials to abuse them.

Henry Ford and Muscle Shoals.

The Lowell (Mass.) Sun and some other New England papers have been commenting recently on the Muscle Shoals situation. This is especially apropos in view of the fact that Henry Ford has never indicated what he intends to do with this big power development, if he gets it, beyond manufacturing some nitrates—perhaps.

In its editorial comment The Sun is of the opinion that the Flivver King is after a ready-made power development that will cost him nothing for the next hundred years and which he could well apply to the manufacture of textiles of which his industry uses large quantities and for which they now have to pay prices considerably in excess of what their cost to manufacture would be, provided Congress decides to grant him this individual subsidy running into the millions of dollars.

That Ford is already branching into the textile field and making extensive experiments along cotton manufacturing lines, under the supervision of competent engineers, lends color to this viewpoint which The Sun expounds, giving it a certain stamp of authenticity. If this should be his plan, there seems no good reason why he should be content to stop with the making of textiles for his own use. With his power and site presented to him by Congress, to be paid for by public taxation, there seems no good reason why he could not undersell the market on any products he chose to make, as his only competitors would be the unsubsidized mills of New England and the South.

Those misguided persons who are now proclaiming him a second Moses and predicting such miraculous prosperity to the whole section should Congress only see fit to start him off by presenting him with a "king's ransom" of the people's money, might do well to investigate the subtle propaganda spreaders who have been working so quietly and constantly during the past several years. What do they expect to get out of it? How many of these quiet workers have an axe to grind?

Outside of the sites for any plants Ford may erect, there must be found sites for urban development where his supposed multitude of employees may be housed or house themselves; where they may spend the money they are to earn by working in his factories, whatever sort of material those factories may produce. Who owns or controls this abutting property? What do they hope to make out of the proposition, or have subdivisions of "house lots" already been sold to individual speculators?

Who first started the rumor that if Ford had this magnificent water power development presented to him by Congress, he was going to electrify the A., B. & A. railroad from Birmingham to Brunswick? It cannot be traced to Mr. Ford. It cannot be traced to his agents. It seemingly cannot be traced to anybody. But the rumor persists.

If The Sun is right in its premise that Ford expects to enter extensively into textile manufacturing it would seem as if New England congressmen would be equally as interested as that group of southern congressmen that another New England paper predicts will soon change their opinions on the Ford offer. Politics may now be listed as a science, and politicians are not fools all the time by any means. Southern rivers are muddy and such muddy water stains almost as badly as oil. Wise men do sometimes change their minds.

Taxes You Pay Without Knowing It.

In 1923, it is announced, the railroads paid in taxes the sum of $330,000,000, or 5.2 per cent of their gross earnings.

A few years ago this would have been pleasing news to many other taxpayers. "At last they are making the railroads do their part," would have been the common conclusion.

But the figures now give joy to few people, and to none who have taken the trouble to study the incidence of taxation—a difficult subject on which much light, never before available, has been thrown during recent years of phenomenally high and curious taxes.

All of us pay our due shares of that $330,000,000 just as surely as we pay for automobile licenses and dog tags. The owners of the railroads get the receipts but the cost is passed on to the public in the form of charges for railroad service just as are the costs of labor or anything else used in rendering that service. Moreover the cost of collecting those taxes, including a profit on the operation, is passed on to others.

Letting the railroads collect taxes is much more economical than doing it in several other ways that make it seem to those who think lightly that the burden of taxes can be shifted from the backs of the many to the backs of the few. In fact, one State lets the railroads and other public service corporations collect for it virtually all the taxes raised. It doesn't do this, however, under any delusion about who ultimately pays them.

Most people now are beginning to realize that no matter how taxes are levied the consumer pays them, and in paying them indirectly usually pays an exhorbitant price for the tedium of collecting.

Yet there are many who would rather see no reduction in taxes than for reduction to be made in the kinds of taxes that are costly deceptions—kinds which often cost the ultimate bearer of them several times what they would if paid directly.

Can the Law of Supply and Demand Be Repealed?

While at this writing it doesn't seem that any proposals in that direction will be translated now into Congressional acts, thoughtful people should not ignore suggestions, made in serious quarters, looking towards attempts to repeal by statute the economic law of supply and demand.

Two bills, among the sponsors for each being many persons who speak with authority, aiming in that direction now pend in Congress, that is if not disposed of before this is printed. At least one of these bills has met with strong committee approval, following hearings in which economists and business men of supposedly sound training urged its adoption.

Both of the bills have to do with agriculture. One, the

so-called Norris-Sinclair bill, would direct the Federal Government to take over the job of buying and distributing most of the staple products of the country's farms. The Government would be expected to buy at more or less fixed prices, such as would insure profits to the producers. Whatever portion of the loss that couldn't be passed on to the public in the form of higher consumer prices would be taken care of from the U. S. Treasury. Apparently at no time has this bill had any big chance of adoption.

Equally as radical and far more elaborate is the so-called McNary-Haugen bill, by the operation of which domestic farm prices would be fixed at or rather forced up, when desirable, to arbitrary price levels. Also under this plan the Government would go into the business of buying and selling farm products on whatever scale necessary to the sustaining of arbitrary price levels. Whatever could not be passed on to consumers would be prorated among producers, via a unique governmental scrip method of paying in part for all original purchases made of products covered in the operations.

This bill has the support of Secretary Wallace of the Department of Agriculture, though President Coolidge has indicated his opposition to it.

Virtually all "farm relief" bills enacted by Congress since depression in agricultural areas began three years ago have failed, or have not achieved any noticeable measure of relief. The reason is that most of them embodied plans essentially artificial—plans which seemed to offer much but in fact accomplished nothing. Most of them have gone counter to sound concepts of economics and business. None, however, has gone so far in that direction as the leading proposals lately put forth seriously both outside and inside of Congress.

It may be possible for Congress to repeal the law of supply and demand but many attempts by governments to do this have resulted in complete failure—and frequently in disaster.

Pension Systems, Sound and Unsound

BY R. L. MATTOCKS.

CONSULTING ACTUARY, CARNEGIE FOUNDATION.

January first is the popular day of the year for starting new pension systems in industry. On that day in 1924 at least seven were inaugurated in various parts of the country, and in the twelve months preceding many more were begun. Indeed, employers are beginning to examine the retirement idea with much more attention than heretofore, partly because they are taking an increasing interest in the welfare of their employees, and partly because the old age annuity contract offers one more aid to increased production and economy in management. Few executives have studied pensions and retirement in any but a very general way. If they had, it is safe to state that most of the retirement plans inaugurated in the past twenty years would have found their way into the waste basket and never reached a board of directors. The plain truth of the matter is that only a few industrial pension systems have any foundation in actuarial science or social experience, and without that foundation any retirement plan is foredoomed to failure, or to a prohibitive cost to the employer which really amounts to failure.

The following discussion is in no sense a synopsis of existing pension systems, nor is it intended to cover the general underlying theory of the subject. What it attempts is to point out the essential differences between retirement systems that are sound and those that are unsound.

Soundness implies not only financial solvency from an actuarial point of view, but also certainty as to the cost of the system, whether that cost be borne jointly by the employer and the employee or by either party alone. Regardless of who pays the cost of any pension system, the fact remains that the necessary money must come from some source and it is only fair that the source should clearly know for what it is liable. Too many apparently sound systems are not in this sense sound because they are so devised that one or more of the sources of financial supply, whether employers or employees, do not know with certainty what further drains will be made upon them in order to preserve the financial solvency of the system.

Unsound Pension Systems.

Bearing in mind this definition of the term "sound," it would be no exaggeration to state that nine out of every ten systems are unsound. This in itself is a most deplorable state of affairs, but, like adding insult to injury, new systems or revisions of old systems are being put into effect from time to time which do not better this ratio. The practical results of present-day knowledge of the subject, while showing a decided improvement as regards financial solvency, still exhibit the unsound feature of indefiniteness as to cost. What organization desires to undertake any sort of financial liability, the ultimate cost of which is indeterminate? That many organizations are doing so, is not an answer. They reluctantly adopt a plan presented to them as the one which is "most expedient" for their purpose. Perhaps they labor under the misapprehension that an unsound plan is better than none.

A list of the unsound systems would embody nine-tenths of all of the systems, whether industrial, municipal, or educational. In industrial systems operating on the contributory basis, where the cost is borne jointly by the employer and the employee, it is common practice to fix definitely the employee's rate of contribution while predicating the amount of pension upon a future salary. Naturally, if the amount of pension is predicated upon the amount of future salary, which no one can foretell, and the employee's rate of contribution is fixed, the employer's contribution must be adjusted to meet the changing economic conditions affecting salaries. Unfortunately from the employer's standpoint, because revisions of salary have practically always been upward, the result has been that the employer has paid and will pay far more than his anticipated share of the cost. If the employer does not increase his contribution to meet the increased pension the fund becomes insolvent.

A notable example of a financially solvent but "unsound" pension plan is the New York City Teachers' Retirement Fund. There is no desire on the part of the

writer to single out this particular system for censure. It is cited merely because it is typical of its kind. This system is based on the accumulation of contributions from both teacher and city, the benefit to consist of a certain proportion of the average annual salary received by the teacher during the last ten years of service. Surely it is not the intention to fix now the scale of teachers' salaries that will be paid thirty years hence! And yet if future salaries are not so fixed how can the proper rates of contribution be determined? Every upward change in the general salary scale calls for a revision of contribution rates; and the later in life the change comes, the larger must be the increase in the contribution due to the decreased effect of compound interest on the remaining contributions. Even if the teacher should pay one-half of the cost, then the balance of the increase in pension must be borne by the city.

The now defunct pension plan of Morris and Company offers a striking example of an unsound industrial system. Although based on the contributory plan, the rates of contribution were pitiably inadequate to meet the expected benefits. So much depended upon the amount of the contribution expected from the employer to take care of the accrued liabilities, arising on account of men entering the system late in life, that upon the absorption of Morris and Company by Armour and Company, the latter firm declined to take over the accrued pension liabilities of the former. The result was the cutting off of pensions that were being paid to a large number of retired employees who had served Morris and Company for many years. These retired employees recently brought suit to have their pensions continued. The decision in this complicated matter is awaited with interest.

Why Pension Systems Break Down.

There are two reasons for the failure of pension systems to continue in satisfactory operation. One is the much discussed factor of accrued liabilities and the other is the factor of increased cost on the part of the employer over that which had been predicted. The financially solvent, but unsound, system takes care of its accrued liabilities by putting the burden of meeting them on the shoulders of the employer, thus placing him in the position of meeting not only the liabilities already accrued but also those which will accrue owing to increased pensions.

It has been suggested that perhaps state supervision over pension systems would prevent failures. It undoubtedly would in many cases, but no power on earth can extract honey from an empty hive. If the employer cannot meet his unlookedfor increased contributions, surely the state insurance department is not going to raise the money for him. State supervision is not the remedy for sick pension systems. The cure lies in starting sound systems, subject to appropriate supervision.

Sound Pension Systems.

The difference between a sound and an unsound system is that the former stands unaided, while the latter needs a crutch.

What constitutes a sound system? The prime factor is definiteness as to the amount of pension. Once the amount of benefit is fixed, either as a certain annual sum of money, or as that amount of annuity which the accumulated contributions will purchase in accordance with a conservative mortality table, then the cost of the system may be definitely expressed. In the first case the cost is that amount of money which set aside annually, will, with its accumulation, produce the amount of benefit desired. In the second case it is whatever percentage of the current payroll it is agreed to set aside annually.

Examples of Sound Pension Systems.

That a sound system works as well in practice as it theoretically should, is borne out by the experience of a dozen or so municipal, educational, and philanthropic plans. To industry, certain of the large life insurance companies offer absolutely safe plans. The principle of all of these sound plans is definiteness of benefit and of contribution. No "assessment" element is introduced.

The "Pay as You Go" plan of the Metropolitan Life Insurance Company, while somewhat complicated as to details, is basically simple and readily adaptable to almost any industrial organization. It is entirely sound.

For universities, colleges, and research institutions, the Carnegie Foundation, through the generosity of the Carnegie Corporation of New York, has developed a central organization, known as the Teachers Insurance and Annuity Association of America, which serves without management charge those particular classes of institutions. It has already entered into arrangements with over one hundred of the leading institutions of learning and research whereby both the individual and his institution pay five per cent of his salary, ten per cent in all, as premiums on a Deferred Annuity contract. As increases in salary take place the amount of premium increases and with it the benefit, but the employing institution has the comforting assurance that its share of the future cost will never exceed five per cent of its salary roll. The amount of old age annuity is that amount which the accumulated premiums will purchase when technically applied as a single premium at the time of the individual's retirement to purchase an annuity in accordance with a standard annuitant's mortality table. Thus the benefit depends upon the individual's earnings throughout his entire period of active service; it is not, and cannot be a definite proportion of an incalculable future salary. This plan is known as the "savings bank" or "thrift" plan.

The Vermont, Massachusetts, and Connecticut Teachers' Retirement Plans embody the same general arrangement as prevails in the Contributory Annuity Plan of the Teachers Insurance and Annuity Association. There is no speculation in these sound plans as to final salary.

Objection to the savings bank plan that it does not readily permit accrued liabilities to be discharged, is met by pointing out that perhaps the most equitable method of administration is to pay sums representing, say, five per cent of back salary for all entering into the plan, commencing with the third or fifth year of service. If the individual duplicates the payment based on years of service rendered before the plan went into operation, his supplementary contributions will serve to swell the amount of his ultimate benefit. Thus all employees, whether new or old, profit in accordance with length of service and the salary received during the whole period of service. The Rockefeller Foundation, and its associated institutions, have adopted this method of taking care of accrued liabilities by paying to the central organization sums representing ten per cent of back salary from age thirty.

An excellent model of a contributory plan serving a professional class, is the Annuity Fund for Congregational

Ministers. This system operates on the savings bank principle and is contractual inasmuch as certificates are issued to all members.

Cost of Sound Pension Systems.

The cost of a sound plan is no greater than that of an unsound plan. Under a sound plan, the cost may be definitely expressed as a percentage of the payroll and provision made to meet it. Under an unsound plan this is impossible.

In pension systems, as in other undertakings, nobody gets something for nothing. Somebody pays for value received. It is, therefore, impossible to estimate the cost of any plan until it is definitely known what the benefits are to be. When considering the installation of a pension system, it is essential that the cost of plans embodying various amounts of benefit and various methods of administration be estimated by a competent actuary in order that those who pay the bills may be fully informed as to the financial outlay.

Three general systems should be considered, all on the contributory basis. The non-contributory system, although actually in effect in a number of concerns, never had any real justification for its existence. These three sound contributory plans are: one that is administered solely through the medium of a life insurance company; one that is administered solely within the offices of the concern; and one that is administered partly within the offices of the concern and partly elsewhere. It is very probable that the last of these will prove most satisfactory in the case of the average industrial organization.

Experience has shown that in the case of teachers a payment of five per cent of salary by the college (the employer) and five per cent by the teacher will produce for the typical teacher retiring at age sixty-five, a retiring allowance of about half his average pay for the last ten years of his service and will continue half of the pension to the surviving widow. Teachers hesitate to retire on less than this provision. It may be that in industrial pension systems three or four per cent payments by both employer and employee will provide retiring allowances upon which satisfactory living may be had in old age for persons whose living expenses are likely to be less than those of college teachers

Some employers may desire to contribute only for those who remain in service until the normal retiring age; that is, at withdrawal or death an employee or his estate would then receive a certain benefit based on the accumulation of only his own deposits. In this case, the ultimate cost to the employer may run as low as one or one and one-half per cent of the current payroll. It is dangerous, however, to anticipate rates of future withdrawal based on past experience because the installation of a retirement system should operate to reduce the labor turnover. If withdrawals are to be anticipated a most conservative estimate should be made.

Sound Practical Plans for Industry.

In preceding paragraphs reference has been made to the "Pay as You Go" plan sponsored by the Metropolitan Life Insurance Company of New York and to a plan administered partly within the offices of the concern and partly elsewhere. In the first plan, the major cost of administration would be included in the premiums charged by the insurance company for deferred annuity contracts purchased for the employee at the end of each year of service. In the second plan the industrial concern itself would assume such expenses up to the time of retirement of each employee. It is not advisable for an employer to tie up his employee's contributions in company funds. He should either at once pay them to a life insurance company, or else deposit them with a trust company to be returned to the man at withdrawal or used to purchase an immediate life annuity at retirement.

The general idea in his second plan involves the accumulation of funds through the medium of a trust company, which would make but a nominal charge for administration, and the using of such funds to purchase an immediate annuity from some life insurance company at the time of the employee's retirement. The employer could set aside each year a sum equal to the employee's contribution with the understanding that, if the man had served a minimum number of years and should be regularly retired by the company, the employer would then duplicate the man's accumulation, provided the entire sum were to be used to purchase an annuity. Of course, the employer's fund would be reduced at every withdrawal or death.

Private vs. State Pensions.

The adoption of a non-contributory pension system by Pennsylvania, under which a benefit of one dollar a day is promised to aged paupers, is, in the opinion of the writer, a step in the wrong direction. Employers everywhere should oppose such systems and bend their efforts towards the installation in their own concerns of sound contributory plans which discourage extravagance by promoting thrift. That at least one large and important Pennsylvania concern recognizes this principle is borne out by this statement: "The adoption of a plan by this corporation, of course, is in line with your own recommendations as against the State taxation for similar purposes."

J. E. Sirrine & Company, Greenville, S. C., are distributing revised editions of three of their booklets, in which the material and illustrations have been brought up-to-date.

"Contentment Under Roof" deals with the proper arrangement and construction of workers' houses in mill villages, as well as the providing of modern community benefits essential in the well planned village. "Picks to the Minute" points out how maximum production may be secured and maintained through the proper selection and arrangement of buildings, machinery equipment, character of drive, air conditioning, light, power, labor, and in the arrangement of departments. "Factories for the Future" emphasizes the necessity for foresight in the construction of manufacturing plants.

The three books are illustrated appropriately with views of work done by this prominent southern engineering organization, and present their subjects in a clear, concise manner.

Under the designation of Alizarine Rubinole R, the Grasselli Chemical Company have placed on the market their domestic manufacture of this well known color. The properties and the chemical composition of both the imported and domestic products are the same, it is stated. It is dyed with an addition of Glauber's salt and sulphuric acid.

Determining Yarn Costs

BY S. R. GORDON
STEPHEN GORDON AND STAFF.

Expense and Final Costs.

The majority of manufacturers seem to consider that their difficulty in getting costs is largely due to their inability to properly apportion the overhead expense of the plant as a whole to the various lines of product. In reality, the manufacturing expense of a plant is not difficult to obtain; and whereas the following methods may appear intricate in description, when put into operation they are extremely easy of execution.

In reality, far less time is required to get the overhead expense per unit of product, than to secure either of the other two principal elements of cost; that is, labor and material.

The method of determining labor costs and apportioning the overhead expense in the right proportion is explained as follows:

Previously in this series we have explained the method of making up the reports listed herewith:

Stores Supply Summary .....Fig. 8
Pay Roll Summary .....Fig. 12
Voucher Record Summary .....Fig. 14
Fixed Charge Sheet .....Fig. 15

The totals of these reports have been checked with the general ledger as previously explained and are the foundation of accurate costs for expense and productive labor, detailed by department and classification.

Every item contained in these reports is posted to Expense Analysis, one expense analysis sheet for each department, both contributary and productive. This posting needs no explanation for every item detailed on the summary reports has a corresponding item on the expense analysis of similar description.

After this posting is done, the procedure is as follows: The electric light bill, for example, is distributed in proportion to the average light used in each department. First, the departments are listed in which light is used, then the number of bulbs in each of these departments is counted and multiplied by the wattage of the lamps. Then from experience the average number of hours each day that the lights are burning is determined and multiplied by the total wattage of each department. This gives the total watt hours consumed by each department each day, and the percentage of the total for each department gives the proper distribution of the electric light bill to each department.

EXAMPLE.

Department	Total Wattage	Average Hrs. Burn'g	Total Watt Hours	Pct. of Total
Machine	500	4	2000	3.6
Office	1000	2	2000	3.6
General Factory	1000	8	8000	14.5
Pick Mix & Lap.....	2000	3	6000	10.9
Card	4000	2	8000	14.6
Draw & Slub	4000	4	16000	29.1
Speeder	1000	8	8000	14.6
Spin	1000	2	2000	3.6
Wind, etc.	1500	2	3000	5.5
Total 16000			55000	100.0

The percentages thus determined are applied to the electric light bill and the amounts for each department charged on the expense analysis sheets for the proper departments opposite the item described as "Light."

The power bill is handled in exactly the same way, except that the basis for obtaining the per cent of distribution is the estimated amount of power used in each department. If the different departments are metered separately, the distribution is very easy; if not, a list of the motors in each department is taken, noting the horsepower, average hours running each day, and the estimated percentage of overloading or underloading. From this information the total horsepower hours for each department is figured and the power bill distributed in that proportion and carried forward to the succeeding departments in the same way as for electric light.

The boiler department, unless an engine is used to develop the power, is used for process steam and heating the plant. If available, a steam flow meter may be used to determine the amount of steam used in processing for mercerizing, etc., as compared to the amount used for heating purposes. The steam during the warm months is, of course, used entirely for processing and is charged in its entirety to the process departments using steam.

When the heat is turned on the percentage of the boiler department used for heating is charged to the departments of the plant in proportion to the floor space occupied.

General Factory.

This department is provided as a means of allocating all items of expense that cannot be charged direct to any other department. The nature of the items listed on expense analysis, Fig. 16, is self-explanatory.

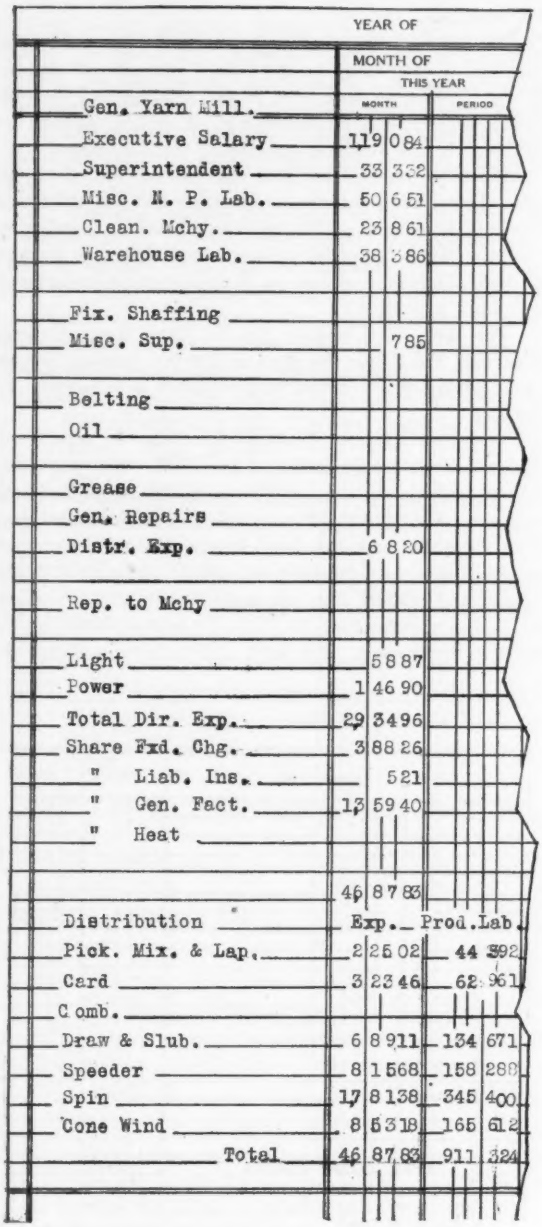
The department expenses are totaled as usual and distributed to the productive departments in proportion to the productive-labor in each of them.

From the pay roll summary, Fig. 12, the productive labor for each of the departments is obtained and posted at the bottom of expense analysis, Fig. 16, under the heading "Labor." The total of these items is posted above, opposite "Total Productive Labor (Entire Plant)." The per cent of Expense to productive labor is next obtained and multiplied by the productive-labor for each department, thus obtaining the amount of general factory expense chargeable to the succeeding departments. These amounts are figured at the bottom of the sheet under the heading "General Factory Expense" and then posted to the succeeding expense analysis sheets under the proper headings.

The previous departments have been contributary to production but have performed no direct operation on the finished article. Pick, mix and lap are the first direct operations and therefore this is the first of the productive departments. The expenses of all contributary departments have been brought forward and charged to the winding and succeeding productive departments.

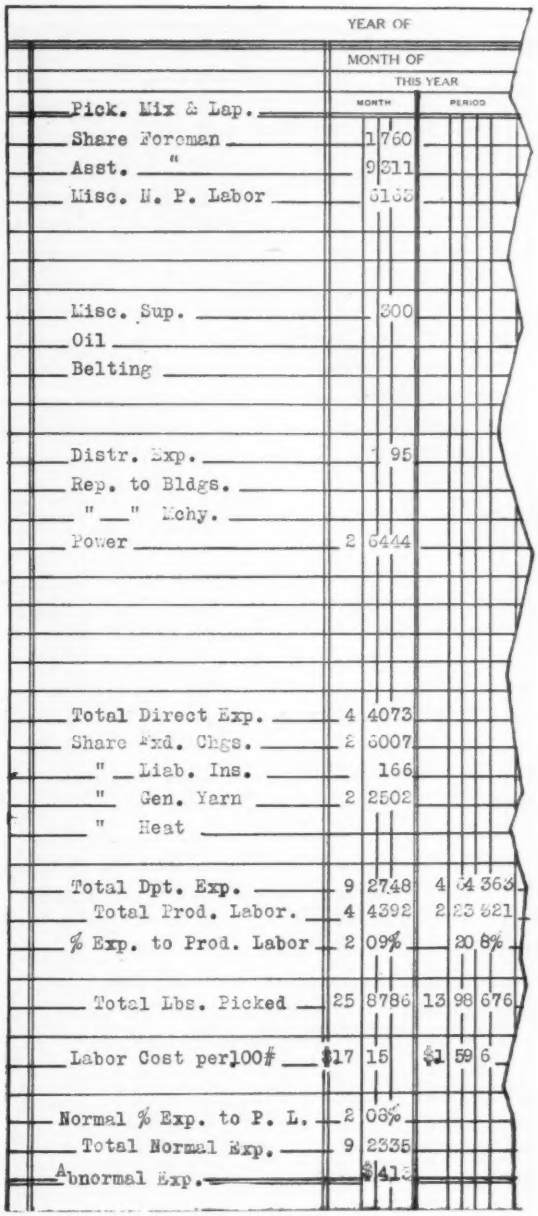
The department expenses are added as shown on Fig. 17, obtaining The Total Department Expense. The total pick, mix and lap productive labor, as obtained from pay roll summary, Fig. 12, is listed on the expense analysis sheet, as shown.

The total department expense is divided by the total pick, mix and lap labor, thus determining the per cent of



Gen. Yarn Mill.	YEAR OF / MONTH OF THIS YEAR — MONTH	PERIOD
Executive Salary	119 08 4	
Superintendent	33 33 2	
Misc. M. P. Lab.	50 6 51	
Clean. Mchy.	23 8 61	
Warehouse Lab.	38 3 86	
Fix. Shafting		
Misc. Sup.	7 85	
Belting		
Oil		
Grease		
Gen. Repairs		
Distr. Exp.	6 8 20	
Rep. to Mchy		
Light	5 8 87	
Power	1 46 90	
Total Dir. Exp.	29 34 96	
Share Fxd. Chg.	3 88 26	
" Liab. Ins.	5 21	
" Gen. Fact.	13 59 40	
" Heat		
	46 87 83	
Distribution	Exp.	Prod. Lab.
Pick. Mix. & Lap.	2 25 02	44 392
Card	3 23 46	62 961
Comb.		
Draw & Slub.	6 8 911	134 671
Speeder	8 1 568	158 280
Spin	17 8 138	345 400
Cone Wind	8 5 318	165 612
Total	46 87 83	911 324

Fig. 16. General Factory Expense Analysis.



Pick. Mix & Lap.	YEAR OF / MONTH OF THIS YEAR — MONTH	PERIOD
Share Foreman	1 760	
Asst. "	9 311	
Misc. M. P. Labor	5 135	
Misc. Sup.	300	
Oil		
Belting		
Distr. Exp.	1 95	
Rep. to Bldgs.		
" " Mchy.		
Power	2 6444	
Total Direct Exp.	4 4073	
Share Fxd. Chgs.	2 6007	
" Liab. Ins.	166	
" Gen. Yarn	2 2502	
" Heat		
Total Dpt. Exp.	9 2748	4 64 363
Total Prod. Labor.	4 4392	2 23 521
% Exp. to Prod. Labor	2 09%	20 8%
Total Lbs. Picked	25 8786	13 98 676
Labor Cost per 100#	$17 15	$1 59 6
Normal % Exp. to P. L.	2 08%	
Total Normal Exp.	9 2335	
Abnormal Exp.	$413	

Fig. 17. Total Department Expense for Picking, Mixing and Lapping.

expense to productive labor. If we know the labor cost per 100 pounds for the operations performed in this department and add to it the per cent of expense, we have the cost of processing for this department.

The labor cost is determined as follows: From material summary, Fig. 8, we obtain the total pounds of cotton used for carded and combed yarns. They are added together and to this total is added the pounds of cotton noils produced by the combing department, for the noils are mixed with the batches for low grade yarns and pass through this department twice.

The total pounds, picked, mixed and lapped thus determined, is posted to the expense analysis, Fig. 17, and divided into the total productive labor, arriving at the picking, mixing and lap labor cost per 100 pounds. We have now determined the labor and expense cost for this department. The method of applying this cost to the yarn cost sheet I will explain later after illustrating the method of determining the process cost for each of the productive departments.

The normal per cent of expense to productive labor and normal labor cost per unit are determined from past experience and cannot be figured until after the expense analysis has been running for at least six months. It will be found that from month to month the actual per cent of expense and labor cost per unit will fluctuate up and down in accordance with the production and expense charges. The period to date figures will of course give the average over the entire period.

After the expense analysis has been running for a num-

YEAR OF				
MONTH OF				
THIS YEAR				
Card	MONTH		PERIOD	
Share Foreman	2	51 2		
Asst. ___"	4	602		
Misc. N. P. Labor				
Misc. Sup.	1	108		
Oil				
Belting				
Distr. Exp.		66 89		
Rep. to Bldg.				
" " Mchy.		42		
Power	3	2320		
Total Direct Exp.	4	7273		
ShareFxd. Chg.	8	5858		
" Liab. Ins.		166		
" Gen. Yarn	3	2346		
" Heat				
Total Dpt. Exp.	16	5643	8	54 632
Total Prod. Lab.	6	2961	3	50 831
% Exp. to Prod. Lab.	2	63%		24 4%
Total Lbs. Picked	25	8 786	13	68 676
Labor Cost per 100#	$2433		$2526	
Normal % Exp. to P.L.		244%		
Total Normal Exp.	1536	25		
Abnormal Exp.	120	18		

Fig. 18. Card Room Expense Analysis.

ter of months, the normal figures may be determined by a comparison of these figures from month to month and the period to date. The normal figures should represent the cost over a period of normal or average production, and are the figures used in figuring final cost which will be taken up later.

In other words, the normal figures are the ones at which the departments should operate. By multiplying the total units produced by the normal labor cost per unit, we arrive at the total normal labor. The difference between the total normal labor and the actual productive labor represents a department labor profit or loss which is directly under the control of the overseer and indicates immediately to the executive whether the overseers are operating their departments economically or expensively and the exact amount in dollars that they have made or lost for the company.

The total normal expense is determined by multiplying the total normal labor by the normal per cent of expense. The difference between total normal expense and the total department expense represents a profit or loss made by the overseer in the overhead expense of the department.

It can be readily seen that the expense analysis is not only the means of determining accurate cost but affords an absolute barometer of the operating conditions and gives the executive a powerful offensive and defensive weapon, to keep the operating men on their toes in an endeavor to cut down expenses.

The method of making up the Card Room Expense Analysis, Fig. 18, is the same as for the previous department, except that the unit of production is somewhat different.

The three different kinds of yarn must be considered: single carded, double carded and combed. The pounds of cotton opened for each kind must be obtained from material summary, Fig. 8. The pounds for single carded yarn plus the cotton noils, produced by the combing department, are multiplied by 1.00. The sum of the pounds for double carded and combed yarn are multiplied by 2.00. The sum of these amounts gives the Unit Pounds produced by the carding department. The total carding labor is divided by

DEPARTMENT ... COMB		
DESCRIPTION	THIS YEAR	
	MONTH	PERIOD TO DATE
Share of Forman	$ 75.25	
Misc. Labor	32.52	
Misc. Supplies	3.33	
Oil		
Belting		
Misc. Expense	12.25	
Repairs to Bldg.		
" " Mchy.		
Power	72.00	
TOTAL DIRECT EXPENSE	195.35	
Share of Fixed Charges	350.00	
Share of Gen. Yarn Mill	79.70	
Share of Heat		
TOTAL DEPARTMENT EXPENSE	$ 625.05	
Total Productive Labor	324.55	
% EXP. to PROD. LABOR	193%	
NORMAL " " " "	200%	
Total Normal Expense	etc.	
Abnormal Expense		
Total Pounds Produced		
LABOR COST per 100 LBS.		
Normal " " " "		
Total Normal Labor		
Abnormal Labor		

Fig. 19. Combing Expense Analysis.

the unit pounds produced giving the labor cost per unit pound. The labor cost for single carded yarns is the labor cost per 100 unit pounds, multiplied by 1.00 for they pass through the cards but once, while the labor cost for double carded and combed yarns is the labor cost per 100 unit pounds multiplied by 2.00 for they pass through the cards twice.

The Combing Expense Analysis, Fig. 19, is made up as explained for the previous departments. The pounds produced is obtained from material summary, Fig. 8, and is the total pounds of cotton opened for combed yarns less the cotton noils produced from the combing machines. The combing labor cost per 100 pounds is the total productive labor divided by the total pounds produced.

Drawing and slubbing is handled as previously explained and illustrated by Fig. 20. The production in this department is obtained from material summary, Fig. 8, and is the summary of the truck tickets, Fig. 9.

YEAR OF				
	MONTH OF THIS YEAR			
Draw & Slub.	MONTH		PERIOD	
Share Foreman	5	3 76		
Asst. "	9	8 84		
Misc. Supplies				
Oil				
Belting				
Distr. Exp.				
Rep. to Bldg.				
" " Mchy.				
Power	1	76 30		
Total Dir. Exp.	3	28 90		
Share Fxd. Chg.	2	97 43		
" Liab. Ins.		521		
" Gen. Yarn	6	89 11		
" Heat				
Total Dpt. Exp.	13	20 65	6	05 301
Total Prod. Lab.	13	46 71	6	24 405
% Exp. to Prod. Lab.		98%		97%
Total Weighed Wt. Spun	21	72 75	11	78 543
Labor Cost per 100#		$.62		$.53
Normal % Exp. to Prod. Lab.		97%		
Total Normal Exp.	13	06 31		
Abnormal Exp.	$	14 34		

Fig.20. Drawing and Slubbing Expense Analysis.

YEAR OF				
	MONTH OF THIS YEAR			
Speeder	MONTH		PERIOD	
Share Foreman	63	52		
Asst. "	116	61		
Misc. Labor				
Misc. Sup.		21 3		
Belting				
Oil				
Distr. Exp.		43 84		
Repair to Bldg.				
" "- Mchy.				
Power	146	90		
Total Dir. Exp.	373	00		
Share Fxd. Chgs.	238	50		
" Liab. Ins.		3 96		
" Gen. Yarn	815	68		
" Heat				
Total Dpt. Exp.	1431	14	8	266 38
Total Prod. Labor	1582	88	9	840 71
% Exp. to Prod. Lab.	90.3%			84%
Total Units Produced	147192		775048	
Labor Cost per 100 Units	$1.07		$1.27	
Normal % Exp. to P.L.	84%			
Total Normal Exp.	1329	62		
Abnormal Exp.	$ 101	52		
	Units		Lbs.	
8½-8½ Gr. Yarn-Unit .26	929		35	74
10 " " " -.39	37			94
11 " " " -.39	43079		1104	60
12-12½ " " " .39				
13 " " " -.39				
15 " " " 1.00				
16 " " " 1.00	103147		1031	47
Total Units	147192		217	275

Fig. 21. Speeder Expense Analysis.

The drawing and slubbing labor cost per 100 pounds is obtained by dividing the total drawing and slubbing labor by the total pounds produced, which in this case are the total pounds of yarn spun.

In some cases the drawing department is considered separately and the slubbing frames included in the speeder or fly frame department. However, in this case we have included the drawing and the slubbing frames as one department and the speeders or fly frames as another.

Up to the drawing and slubbing department the production was based on the pounds of cotton opened. From that point on the differentiation between the yarn numbers becomes more pronounced and the production will be based on the pounds of yarn actually weighed off of the spin-

ning frames, as obtained from the recapitulation of truck tickets, Fig. 9.

In this department the roving is drawn on the intermediate and fine frames, the number of speeding operations being dependent upon the number of yarn to be spun.

The speeder production units which differentiate the labor cost for the differentiating yarn numbers are obtained as follows:

First, speeder tests must be made to determine the time to produce 100 pounds of roving for the different hank rovings used in producing the different numbers of yarn.

EXAMPLE OF SPEEDER TEST.

Speeder Frame No. 12432	Hank Roving 3½
Time test started	11:25 A. M.
Time test finished	4:03 P. M.
Elapsed time	3.38 hours
Gross weight roving produced	223 lbs.
Tare weight (bobbins)	101 lbs.
Net weight roving produced	122 lbs.
Time to produce 100 pounds of roving	179 min.

Similar tests are taken for all hank rovings used. Let us assume the following times have been determined from tests.

TABLE.

	Time to Produce 100 lbs.
1¼ Hank Roving	67 min.
2½ " "	97 "
3½ " "	179 "
5½ " "	340 "
Etc., etc.	

The following table must then be made up for the different yarn numbers, showing the speeder operations and giving the total speeder time required for each.

SPEEDER UNIT TABLE.

Yarn No.	1¼ Hank Roving	2½ Hank Roving	3½ Hank Roving	5½ Hank Roving	Total Time	Unit
16s	67 min.		179 min.		246.	1.00
26s	67 min.			340 min.	407	1.65
36s	67 min.	97 min.		340 min.	494	2.01

A table similar to the above must be made up for all numbers of yarn spun and based upon production tests actually taken on the machines and the different hank rovings actually used, which will in all probability be entirely different from the figures shown in the foregoing table.

In the table 16s yarn is considered as having a Speeder Unit of 1.00. Then to obtain the Speeder Unit for all other numbers of yarn, divide the total time as shown in the speeder unit table by 246 minutes which is the speeder time per 100 pounds for 16s yarn.

The labor cost for speeding is, of course, proportionate to the length of time taken in the speeder department for the different numbers of yarn. The Units are used merely for convenience and give the proper proportion of cost, for they are figures derived from dividing the time per 100 pounds for each number of yarn by a common divisor, 246, and therefore must be in the same proportion with the original time figures.

The pounds produced by yarn number as obtained from truck tickets, Fig. 9, are multiplied by their respective Speeder Units, and added together giving the total speeder unit for 100 pounds produced.

The total speeder productive labor is divided by the total units produced, arriving at the speeder labor cost per 100 unit pounds. To figure the speeder labor cost for any number of yarn, merely multiply the speeder unit for that number of yarn by the labor cost per 100 unit pounds.

The method of determining the cost in the spinning department is very similar to that used in the speeder departments. The expense analysis is illustrated by Fig. 22.

Production tests must be taken in this department similar to the one shown herewith.

SPINNING PRODUCTION TEST.

Spinning Frame No. 767	Yarn No. 11s
Time test started	2:00 P. M.
Time test finished	4:01 P. M.
Elapsed time	121 min.
Gross weight yarn produced	100 lbs.
Tare weight (276 bobbins)	56 lbs.
Net weight yarn produced	44 lbs.
Weight per hour per 100 spindles	7¾ lbs.

Similar tests are taken for all numbers of yarn and tabulated as follows:

SPINNING UNIT TABLE.

Yarn No.	Weight per Hour per 100 Spindles	Time to Produce 7¾ Pounds per 100 Spindles	Unit
11s	7¾ lbs.	60 min.	1.00
12s	7.1 lbs.	65 min.	1.10
13s	6.7 lbs.	70 min.	1.17
14s	6.2 lbs.	75 min.	1.25
15s	5.8 lbs.	80 min.	1.33
16s	5.3 lbs.	88 min.	1.46

In the table the time it takes to produce 7¾ pounds

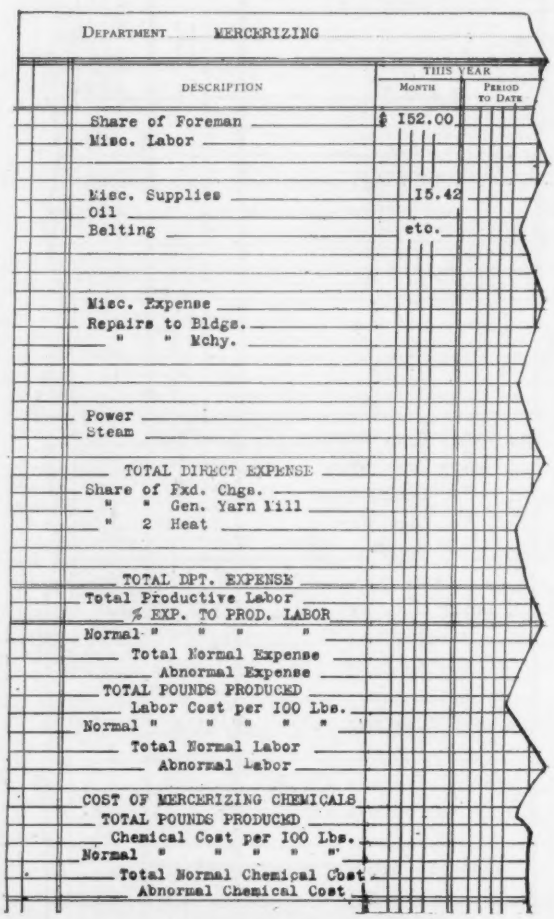
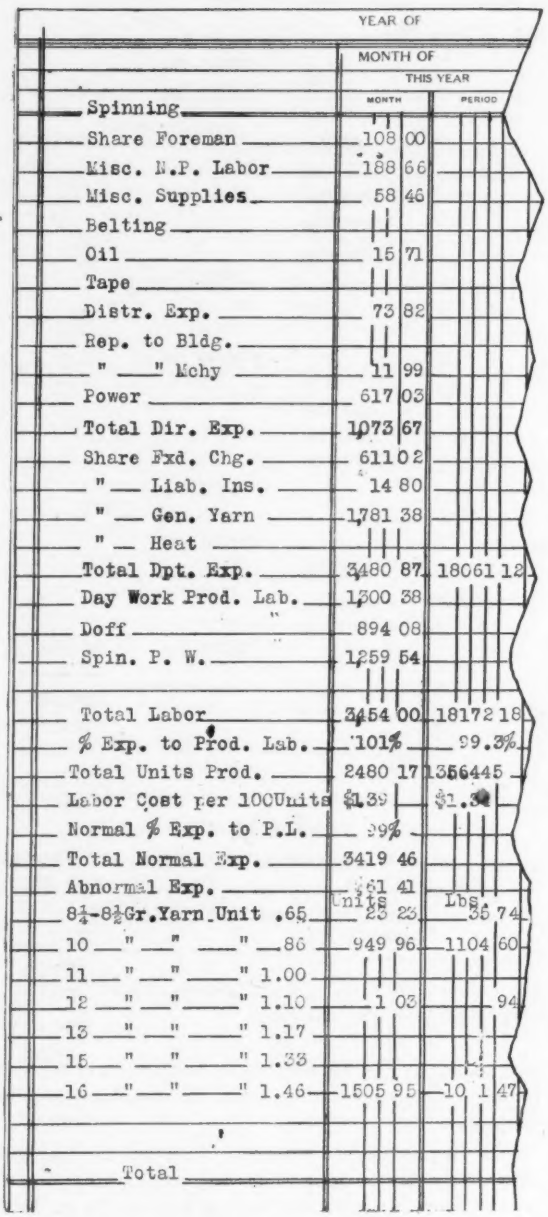
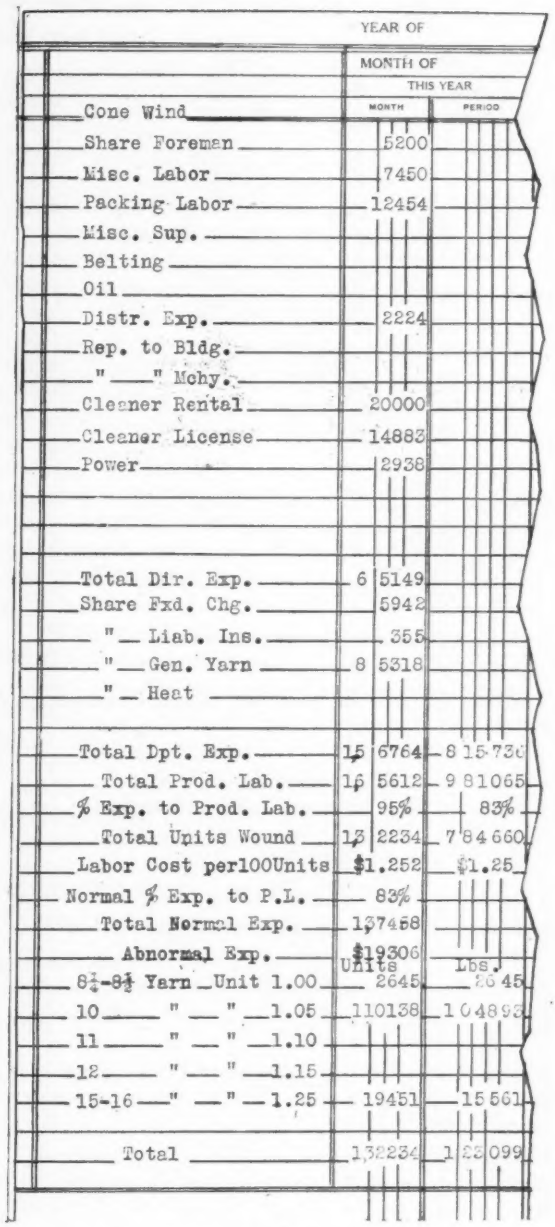


Fig. 24. Mercerizing Expense Analysis.



Spinning	YEAR OF / MONTH OF THIS YEAR — MONTH	PERIOD
Share Foreman	108 00	
Misc. N.P. Labor	188 66	
Misc. Supplies	58 46	
Belting		
Oil	15 71	
Tape		
Distr. Exp.	73 82	
Rep. to Bldg.		
" " Mchy	11 99	
Power	617 03	
Total Dir. Exp.	1073 67	
Share Fxd. Chg.	611 02	
" Liab. Ins.	14 80	
" Gen. Yarn	1781 38	
" Heat		
Total Dpt. Exp.	3480 87	18061 12
Day Work Prod. Lab.	1300 38	
Doff	894 08	
Spin. P. W.	1259 54	
Total Labor	3454 00	18172 18
% Exp. to Prod. Lab.	101%	99.3%
Total Units Prod.	2480 17	1356445
Labor Cost per 100Units	$1.39	$1.34
Normal % Exp. to P.L.	99%	
Total Normal Exp.	3419 46	
Abnormal Exp.	61 41	
	Units	Lbs.
8¼-8½ Gr. Yarn Unit .65	23 23	35 74
10 " " " .86	949 96	1104 60
11 " " " 1.00		
12 " " " 1.10	1 03	94
13 " " " 1.17		
15 " " " 1.33		
16 " " " 1.46	1505 95	10 1 47
Total		

Fig. 22. Spinning Expense Analysis.



Cone Wind	YEAR OF / MONTH OF THIS YEAR — MONTH	PERIOD
Share Foreman	5200	
Misc. Labor	7450	
Packing Labor	12454	
Misc. Sup.		
Belting		
Oil		
Distr. Exp.	2224	
Rep. to Bldg.		
" " Mchy.		
Cleaner Rental	20000	
Cleaner License	14883	
Power	2938	
Total Dir. Exp.	6 5149	
Share Fxd. Chg.	5942	
" Liab. Ins.	355	
" Gen. Yarn	8 5318	
" Heat		
Total Dpt. Exp.	15 6764	8 15-730
Total Prod. Lab.	16 5612	9 81065
% Exp. to Prod. Lab.	95%	83%
Total Units Wound	13 2234	7 84 660
Labor Cost per100Units	$1.252	$1.25
Normal % Exp. to P.L.	83%	
Total Normal Exp.	137458	
Abnormal Exp.	$19306	
	Units	Lbs.
8¼-8½ Yarn Unit 1.00	2645	26 45
10 " " 1.05	110138	1 04 893
11 " " 1.10		
12 " " 1.15		
15-16 " " 1.25	19451	15 561
Total	132234	1 23 099

Fig. 23. Winding Expense Analysis.

per 100 spindles is figured for each number of yarn. The labor cost is in proportion to the time taken to produce a given quantity of yarn for each number and therefore is in proportion to the figures shown in the table under the heading "Unit." These figures are merely used for convenience, taking the 11s yarn as a unit of 1.00 and dividing the time for each number of yarn by 60, which is the time for No. 11 yarn.

The pounds produced by yarn number as obtained from truck tickets, Fig. 9, are multiplied by the respective spinning units and added together, thus obtaining the total unit pounds produced.

The total spinning labor is divided by the total unit pounds produced, arriving at the spinning labor cost per 100 unit pounds. The procedure from this point on is the same as described for the speeder department.

The winding department is illustrated by expense analysis, Fig 23, and is handled in the same manner as described for previous departments. The units are based on production tests for the different numbers of yarn or the piece-work prices which are, of course, based upon production tests similar to those taken as a basis for production Units.

The methods used in the mercerizing department are illustrated by expense analysis, Fig. 24.

The pounds of yarn delivered for mercerizing and the finished weight of the mercerized yarn must be recorded, for there is a considerable gain in weight due to the mercerizing process which will in some cases run as high as 5 per cent and must be taken into consideration in figuring the cost of mercerized yarn.

The total mercerizing labor is divided by the total

YARN MILL WASTE

Period from May 25th to June 29th.

Inventory of goods in process May 25th		85661 lbs.	
Cotton opened May 25th to June 29th		268711 lbs.	
Waste			
Clear Waste	87 lbs.		
Dust Room	565 lbs.		
Picker Seeds	5588 lbs.		
Sacking	10621 lbs.		
Hoops	3507 lbs.		
Total Pick & Mix Waste		20368 lbs.	
Per cent Waste to Cotton Opened 7.6%			
Total Weight to Cards		248343 lbs.	
Waste			
Cylinder Strips	2510 lbs.		
Card Sweeps	1365 lbs.		
Card Screens	2777 lbs.		
Total Carding Waste		6652 lbs.	
Per Cent Waste to Cotton Opened 2.5%			
Total Weight from Cards		241691 lbs.	
Spinning Waste	1148 lbs.		
Per Cent to Cotton Opened .4%		1148 lbs.	
Total Weight Processed		240543 lbs.	240543 lbs.
Total May 25th Inventory and Weight Processed			326204 lbs.
Inventory Goods in Process June 29th, 1918			74953 lbs.
Total Calculated Weight Spun			251251 lbs.
Total Actual Weighed Weight Spun			240457 lbs.
Invisible Loss	10794 lbs.		10794 lbs.
Per cent Invisible Loss to Cotton Opened 4.0%			4%
Total of All Waste	38962 lbs.		38962 lbs.
Per Cent Total Waste to Cotton Opened 14.5%			14½%

To determine amount of cotton necessary to produce a given amount of yarn, multiply amount of yarn by 117%.

Fig. 26. A Method of Compiling Waste Figures.

pounds of yarn delivered to the mercerizing machines, thus arriving at the mercerizing labor cost per 100 pounds of yarn.

The chemical cost for mercerizing is determined by dividing the cost of the chemicals used, as obtained from material summary, Fig. 8, by the total pounds of yarn mercerized.

The production weights used in the mercerizing department are based upon the weight of the yarn before mercerizing. The reason for this is to facilitate figuring the final cost of mercerized yarns. If the mercerizing gain in weight figures 5 per cent, to figure the cost of a mercerized yarn, we merely add to the cost of the combed yarn the labor and expense cost of skeining and mercerizing and the mercerizing chemical cost, and divide this total by 1.05 which makes the proper allowance for the gain in weight.

Summary.

In developing the labor cost in a yarn mill, you will notice that in no instance have we used the piece prices paid the operators. All of the piece work operations in a yarn mill, other than winding, are based upon the frame clock readings which do not allow for ends that are down or not operating and would therefore give an erroneous cost basis. In the winding department, learners are continually being trained, which raises the cost above the piece work price.

The unit method is particularly adapted to yarn spinning and after the units have been established, the cost records based upon the unit method requires the minimum of clerical help, and not only gives records that are absolutely accurate, but develops the cost for each number of yarn without resort to the usual average yarn number method.

I have now finished the detailed explanation of the expense analysis in which is developed the productive labor cost and the overhead expense cost in each department for every number of yarn.

Attention is directed to the form of these expense analyses. Their primary duty, of course, is to give us the total and overhead expense cost, but there exists a secondary value that will be found to be worth thousands of dollars per year if properly used.

The current month's expenses are first shown and then the total of the year to date. In close juxtaposition, we are shown the expense of the same month and same period of the preceding year. The result is that when we study

PICKING DEPT NO._____

WEEK ENDING_____ 19____

WASTE	
Picker Seeds	Pounds
Dust Room	Pounds
CARD STRIPS—White	Pounds
" " —Egpt.	Pounds
" " —Colored	Pounds
" Screen	Pounds
" Sweeps	Pounds
" Oily	Pounds
SPINNERS	
" —Roving	Pounds
" —Stick	Pounds
" —Clearer	Pounds
" —Threads	Pounds
" —Sweeps	Pounds
MISC. WASTE	
Hoop Ends	Pounds
Sacking	Pounds
Leather	Pounds
Paper	Pounds
Cast Iron	Pounds
Brass	Pounds
Zinc	Pounds
Lead	Pounds

Fig. 25. The Waste Report.

expense percentages at the foot of the expense analyses of the productive departments, we can tell whether the figure is on the increase or decrease; and if the former, the element of expense, which is increasing, is readily ascertainable.

Final Cost.

We have thus far explained the method of determining the labor and expense cost and the cost price of the cotton. One of the most important items in the cost of yarn is cotton waste developed throughout the course of processing. In other words, how much raw cotton does it take to produce 100 pounds of yarn. This, of course, depends upon the grade of cotton used, the kind of yarn spun and the equipment of the mill.

Certain of the waste, such as card sliver, soft roving, etc., is used over again being immediately placed in the mixing batches. Therefore, it is not necessary to make any record of this waste. There are other classes of waste that are bagged and sold. As this waste is bagged it should be weighed and recorded on Waste Report, Fig. 25.

A summary of the weighed waste is made once a month and applied to the weight of yarn spun, arriving at the percentage of waste. This percentage, however, does not include all of the waste for there is an invisible loss which is not included in this figure. The invisible loss should be checked at least once every three months by an inventory of goods in process.

Figure 26 illustrates the method of compiling the waste figures and developing the actual per cent of waste including the invisible. The percentage of waste is different for every mill and should be carefully determined for it represents a very considerable proportion of the yarn cost.

The waste in this instance amounts to 14½ per cent of the total weight of yarn spun. Therefore, to produce 100 pounds of yarn, we must start with 100 pounds divided by 100 per cent minus 14.5 per cent, equals 117 pounds of cotton.

We have now developed all of the figures necessary to make up the final cost of yarn.

Form C128. IM. 2-18

DISPOSITION_____ YARN COST CARD YARN NO. 16 S

DESCRIPTION Corded Cotton Yarn DATE 7/18/—

DESCRIPTION	P. C. LOSS	WEIGHT	PRICE	LABOR	P. C. EXP	EXPENSE	TOTAL
Pick, Mix and Lap	14½	117	$ .16	.1872	208	.3894	.5766
Card		"	.25	.2925	240	.7020	.9945
Comb							
Draw and Slub		100	.53	.5300	97	.5147	1.0447
Speeder Unit 1.00		"	1.20	1.2000	84	1.0080	2.2080
Spin " 1.33		"	1.15	1.5295	97	1.4836	3.0131
Cone Wind " 1.25			1.25	1.5625	83	1.2969	2.8594
TWISTING							
MERCERIZING							
Total							$ .106963
Cotton	14½	117	$ .3487				$ 40.7979
MERCERIZING CHEMICALS							
Total Cotton							
Total Labor Exp. and Mat.							$ 51.4942

TOTAL COST $ 51.4942 TOTAL LBS. FIN. 100 COST PER LB. 51.49 ¢

Fig. 27. Final Yarn Cost Card.

Final Cost Card, Fig. 27, illustrates the method of figuring the final cost of the yarn.

The cost is developed operation by operation for the different numbers of yarn. The labor cost units for each department are first noted, then the per cent of waste for each department, thus obtaining the pounds of cotton, roving, etc., that has been processed to produce 100 pounds of yarn. In the departments whose production is measured on the pounds of cotton opened this weight for a 14½ per cent waste is 117 pounds, while for all of the other departments the weight is 100 pounds.

Under the column headed "Price" are noted the figures for the labor cost per unit 100 pounds as obtained from the Expense Analysis. Then the unit multiplied by the weight, multiplied by the price per unit gives the labor cost for each operation. The per cent of expense to productive labor as given in the expense analysis for each department is applied to the labor costs, giving the expense cost for each department.

Figuring 14½ per cent cotton waste, it takes 117 pounds of cotton to produce 100 pounds of yarn. This weight is multiplied by the normal cost of cotton as obtained from Fig. 8, giving the material cost. The cost card is then totaled giving the total cost per 100 pounds of yarn. This figure is divided by 100, arriving at the yarn cost per pound.

To figure the cost of combed yarns, the labor and expense cost of combing are added opposite the operation "Combed" of the final cost card and the weight of cotton for picking and carding must be increased by the per cent of cotton noils produced in the combing department.

If the yarn is doubled, twisted, etc., the labor and expense cost as developed in the expense analysis is added.

The methods outlined, although they may at first seem to be voluminous, are, as a matter of fact, very simple and easily kept up giving the exact cost of each number of yarn.

The usual method of figuring the cost on an average number of yarn produced is inaccurate and tends to lower the cost on the coarse numbers while raising the cost on the finer numbers, which, to say the least, is misleading to the executive of a mill, and can be obviated by the use of the unit method, which requires a minimum of clerical help in its perpetuation.

[This is the final article of a series of articles on yarn cost finding by Mr. Gordon.]

Answers to many problems which confront individuals and corporations in making up their annual income tax returns are supplied by the 1924 edition of "Questions and Answers on Federal Tax Laws" just issued by Irving Bank-Columbia Trust Company.

The former book, as its name implies, deals with the subject of Federal income taxes only; the book on the State income tax laws covers both the personal income tax law and the corporation income tax law. The text of these respective statutes, including amendments in 1923, are printed in full. In addition, each book treats in question-and-answer form a wide range of typical cases which arise in the computation of income taxes for the Federal Government and the State.

Intangibles in Manufacturing

A Series by

Frederick H. McDonald.

Auxiliary Aids to Production.

The larger the plant, the more profitable it is to have a few auxiliary departments helping the main job along.

Production is made easier if a planning department figures out schedules and quantities ahead of time—and sees that the stuff is there when it is needed.

An Engineering department can often reduce coal bills, and give more power through fuel and steam consumption analyses. Or by working out changes in design of products; or adapting machinery to new uses; or by putting in conveying and automatic handling systems with savings in labor—doing a lot of helpful saving in methods.

A Chemist is helpful around some plants, that buy and use large quantities of chemicals, in testing and inspecting the supplies. Keeping them up to grade may save a lot of "seconds" and rejected output.

A Statistical section is helpful in showing the trends of departments, and the possibilities of the business. Variations in production can be indicated, and their causes sought out and analysed with considerable resulting profit. Comparative statistics are the one sure way of keeping a finger on the pulse of a business.

Finally, an adequate Cost department, or system is essential to real profit—it makes the business a certainty, instead of a guess.

"The Textile Manufacturer Year Book" for 1924 has just been issued by Emmott & Co., Ltd., publishers, of 65 King Street, Manchester, England. The new edition of this authoritative English textile manual includes several new features in addition to the regular departments continued from previous editions. Among these is a new section on the bleaching of cotton, dealing succinctly with modern practice in the bleaching of raw cotton and waste, absorbent or surgical cotton, yarn and woven and knitted fabric. Another section is devoted to the dyeing of textile materials, and there is also a new section on knitting. A number of other new features have been introduced. The book may be secured through Cotton's book department.

The Grasselli Chemical Company has been named sole selling agent outside of New England for the new Alizarine Red Powder, recently placed on the market by the Beaver Chemical Corporation. This product is identical in its shade properties with the well known imported brands of Alizarine Red W, WB, and IWS, it is stated.

Fall River Operating Executives Hold Section Meeting on Spinning and Weaving

At a meeting held at the Bradford Durfee Textile School, Fall River, Mass., questions of interest to the spinning and weaving departments were listed to be brought up for discussion.

Edward Bohnner, secretary of the Associated Industries of Massachusetts, in calling the gathering to order, officially turned the meeting over to Arthur Bishop, chairman of the Committee in charge of this meeting. Mr. Bishop addressed the men expressing his gratitude for their turning out in such a goodly number and stated that the Committee felt pleased in that they were able to secure George W. Foster of the Universal Winding Co., who had consented to give a talk on 'The Advantages of Filling Preparation to Spinning and Weaving."

"This subject," he continued, "is of great importance and there certainly are many different viewpoints concerning it. Mr. Foster, from his experience, I am sure, will be able to give us some very enlightening points about this matter."

"The subject for your consideration this evening is the art of filling preparation and its effect on spinning and weaving processes ," began Mr. Foster.

"This art is represented by two classes, one, that deals with silk and colored yarns that present such form and shape as to make the adoption of a preparatory process imperative; so much so that it need not be given any further consideration.

"The other, which applies to the winding and inspecting of grey filling yarns for convertible goods manufacture, where the adoption of the idea injects into manufacturing an additional process contrary to precedent and practice methods of a century or more; and it is to consider this particular phase of the art that I seek your indulgence for the time allotted me this evening.

"With the exception of those mills that now wind and prepare their filling yarns for weaving, it always has been, and is now, the common practice to spin grey filling for direct weaving consumption, with the result that imperfections and inequalities in spinning must either be weeded out at the loom, or be woven into the cloth. (In this connection, you will please bear in mind that in weaving you are dealing with a process where values and departmental costs are peak-high.)

"Spinning is an art or practice that does not permit stress or strain on materials, for at this point you are dealing with roving that has no marked tensile strength; consequently, the amount of filling yarn contained on a filling bobbin is limited by these conditions.

"Furthermore, since the days of hand looms we have been spinning filling to fit a hole in a block of wood; in other words, the inside dimensions of the shuttle have held spinning to lower gauge limits than would be practical if the art were given a chance for itself. I am aware that spinning limitations are controlled by other factors inherent in the art, but I think you will agree that the incentive to determine these limitations is entirely lacking when the shuttle arbitrarily pre-determines the size limit.

"In this connection," continued the speaker, "I take the liberty of questioning the advisability of fixing an arbitrary limit for an important process, where the operating units are twenty times greater than the units that effect the control.

"For example, under common practice an overseer of spinning must keep approximately 40,000 spindles at concert pitch in order to supply acceptable packages to 2000 looms. Draft rolls, rings, travelers, bands, builder motions, etc., must function properly at the ratio of 20 to 1; otherwise, the peak process represented in the weaving must suffer. (I think you will agree that were the conditions reversed the task would be much easier.)

"As a matter of fact, the limit set by the shuttle is seldom taken full advantage of. Spinning conditions at the above ratio will not permit it. The overseer of spinning must always play on the safe side, in order to prevent oversized or bunchy bobbins from being made.

"This practice is responsible for direct loss in machine and hand time, or in other words, two important processes have been penalized through the restrictions set up by this direct practice. The proof of this contention is apparent in the method of handling warp yarns, for here we find a tendency to spin as large a package as spinning conditions will permit, in order to most effectually serve an intermediate spooling process, with the result that spinning and warping processes are not penalizing each other.

"Outside of assumed cost, there seems to be no good reason why filling yarns should not receive the same preparatory attention that warp yarns receive, for it is an outstanding salient fact that the mental attitude of manufacturers towards the system of filling preparation shows that while they may question the advisability of adopting the idea, they never fail to express unqualified approval of its inherent value to prior and subsequent processes; in other words, there seems to be no question as to its desirability.

"The intermediate process of filling preparation is one that winds filling or weft yarns in long, uninterrupted lengths for weaving, and it might well be termed a reduction process, its function being to transfer the contents of a large container, or the contents of two or more smaller containers, onto a tube or bobbin of suitable dimensions to serve a subsequent process.

"If an intermediate winding process for filling is adopted it is then of great advantage to spin filling to as large dimensions as spinning conditions will permit, and there are no restricting specifications to handicap spinning conditions; neither will any deflections in spinning penalize the preparatory process.

"In mills where ring frame filling yarns are spun for a preparatory instead of a weaving process, the practice is to use as large rings as conditions will permit, and where warp and filling yarns are not too widely separated, it is the practice to spin warp and filling with the same size ring using warp bobbins, filling build throughout, builder motions on spinning frames being set to insure full capaci-

ty bobbins.

"Such practice materially reduces the number of weekly doffings in the spinning room, which is equal to a gain in the spindle operating minutes. As far as the practice has been established, this gain seems to range between 2½, and 3 percent.

"Spinning with larger rings also effects a marked reduction in the cost of doffing, which is a considerable item at the present time.

"You will readily appreciate the marked flexibility of spinning and bobbin equipment, were a mill to spin its warp and filling yarns with the same size rings, for it is obvious that any gain in spinning efficiency could then be easily pro-rated into the element required by cloth construction.

"With approximately double the amount of yarn on a filling bobbin, departmental transfer costs will be reduced.

"Please do not imagine that suggestions to increase the size of spinning rings meet with no opposition, for opposition is always found when one attempts to inject a new idea contrary to precedent and practice methods.

"Also understand that it is not my idea to definitely determine the size of rings to be used when spinning filling for a preparatory process, but rather to convey to you the idea, in order that you may become sufficiently interested to determine these facts for yourself, and the company you represent, suggesting that you always have in mind the use of a warp bobbin with a larger ring, for this will effect the desired improvement and will lessen yarn stress in the spinning practice.

"I have often been told that if the size of the ring is increased the traveler will not stand the additional friction it would be subject to. This I will admit is a little difficult for me to understand, in view of spinning practice in the yarn mills, spinning practice on warp frames in the cloth mills, and what is more to the point, spinning practice in mills where filling is now being wound for a preparatory process.

"In my investigation I find that until recently there has been no marked improvement made in travelers since the year 1824; on the other hand, I find that recently a new style of traveler has been perfected that is 25 percent harder at the horn than at the bow. This result is accomplished by a simple method of construction that allows spring temper to run to the bow before it reaches the horns.

"I simply mention this in passing, as I do not like to think that so small a unit as a traveler should stand in the way of a progressive idea.

"While a considerable advantage and profit can be gained in spinning by the use of larger rings, a greater advantage will be found in the intermediate winding process which we will now consider.

"The cost of winding is largely controlled by the size of supply furnished this process. A concrete example will best illustrate this point. A mill in Maine, spinning 26/1s carded filling, 1-1/16 inch stock, first attempted to rewind the filling spun with 1⅜ inch rings, with the result that a winding operative with knot tyers handled 30 spindles and produced between 600 and 650 pounds per week of 54 hours.

"This same mill was finally induced to spin this same count with 1⅞ inch rings (which is their warp size), and a winding girl is now taking care of 40 spindles and producing over 900 pounds per week.

"Dividing these two productions into a weekly wage of, say, $18.00, will give you some idea of how a large supply effects a reduction in the cost of filling preparation.

"The winding machine to wind filling yarns onto bobbins for a shuttle is so constructed that each spindle is independent, and so accurate in its function that bobbins of uniform size can be made. In other words, it is possible to wind every bobbin to the maximum limit pre-determined by the shuttle; therefore, this intermediate winding process wipes out the penalizing factors in prior and subsequent processes previously referred to, each important process being allowed to function to its fullest advantage.

"During a winding process imperfections made in the spinning are broken out, and at least double the usual amount of material is placed on the weaving bobbin, and it follows that the ideal combination would be to spin an uninterrupted length of filling material, equal to the improved length wound on the bobbin, for it will be plain to you that this would result in a simple transfer process at the winding machine, there being no knots in the filling except where imperfections occur, a winding spindle only stopping once for the change of supply and wound package.

"When considering the effect of a preparatory process on weaving, it is well to bear in mind that we are dealing with a process where costs and values are peak-high, also commercial quality must be maintained. Filling breaks and filling changes are responsible for these imperfections in weaving, which manufacturers for a century or more have been anxious to overcome.

"James Northrop recognized this when he invented the automatic loom as did J. R. Leeson when he conceived the idea of grey filling preparation, the object and purpose of both improvements being to establish greater continuity of loom motion. in order to improve quality and save hand and machine time in the weaving process.

"The improvement represented in the preparatory process is the only one which permits a prior inspection of material to remove imperfections made in spinning, and as the fundamental idea of the process is to double or triple the amount of filling usually placed in a shuttle, it follows that defects in cloth will be reduced in exact proportion to the improvement in yarn quality and increase in yarn quantity; in other words, the elimination of filling breaks and the reduction in filling changes represent the sum total of improvement in this respect.

"It is interesting to estimate the result of these improvements on a weaving process. First let us consider its effect on the wastage of filling materials.

"When filling is spun on ring frames the wastage in weaving ranges from 2½ percent, representing the minimum, to 4 percent, plus, the maximum. While this might be said to represent the waste account in weaving, I believe another loss is oftentimes sustained, either through waste, or the expense of reclaiming bobbins that are spun oversize, or bobbins with bunches that prevent their being used in the shuttle.

"With an intermediate winding process these losses are practically eliminated, there being no discriminating factors to reject badly spun bobbins. In automatic looms, where feeler motions are employed the saving in weaving waste is approximately 60 percent, and it naturally follows in this particular case, that the expense of reclaiming feeler

waste is lessened in exact proportion.

"So marked a saving in waste, if figured correctly over a yearly period, amounts to a considerable dollars and cents item, for the pounds represented by this loss should be available for cloth construction, which is the medium on which profits are enjoyed.

"Speaking of profits or losses, understand that propositions of this nature should not be figured under abnormal or sub-normal conditions.

"Let us next consider the effect of a preparatory process to improve plain loom efficiency.

"In this connection, available information shows us that when yarns are inspected and prepared in long lengths for weaving plain goods, loom efficiency is increased 5 percent, while the improved efficiency on plain looms weaving fancy goods ranges from 10 to 12½ percent.

"This latter improvement may impress you as being extremely high, so bear in mind that a rewound bobbin of fine filling will run 30 to 40 minutes without a break; also bear in mind that when weaving fancy goods considerable time is lost in matching picks and patterns when interferences due to filling breaks and filling changes occur.

"Any increase in loom efficiency is a very important factor for consideration, not only for its direct effect on overhead, but because of its bearing on the direct labor cost of weaving, and the opportunity it presents to enjoy additional margins of profit.

"In a recent article an authority states, 'A 7 per cent increase in production will reduce the manufacturing cost one cent a pound on print cloth.'

"A close study of conditions in mills operating the preparatory system indicates that a substantial reduction in filling breaks and filling changes permits the readjustment of loom jobs to effect savings in direct labor cost of weaving.

"Where plain looms weaving plain goods are being operated, loom jobs are usually increased 50 percent, although in some instances a greater increase has been considered feasible.

"Where looms weaving fancy goods are being operated, loom jobs are seldom increased over 25 percent, and in some instances, not at all, for it is apparent that in this class, where values are usually high, the substantial increase in loom efficiency is comparable to any change. In direct connection, you might bear in mind that when applying percentages on high values, correspondingly high savings result.

"When piece prices are adjusted to fit the changed conditions, the three following factors are usually taken into consideration, First, the difference in size of loom job; second, the improvement in loom efficiency; third, the extent of labor's participation in the improvement, and it is reasonable to assume that an equitable revision on this basis has been found satisfactory and profitable to all concerned.

"The effect of a preparatory process on quality is too well understood to require detailed analysis; sufficient to say, that a method which serves a peak process with long uninterrupted lengths of inspected material is bound to mitigate the evils coincident to constant interruption, and it follows that if filling breaks and filling changes are responsible for difficulties that lower values, then a reduction in these interferences must preserve values for ideal profit. Moreover, improvements in this respect must lessen cost of inspection and classification.

"I have often been reminded that on staple prints improvement in quality is not of sufficient importance to recommend filling preparation. It is not my prerogative to question this point, except that I have always been under the impression that from a competitive commercial standpoint quality is always desirable in any line of manufacture. Furthermore, if there is such a thing as seconds in the staple line referred to, then there must be a discriminating point that changes values.

"Up to the present time more plain than automatic looms have been served with prepared filling. The reason for this is obvious when one considers that by degree a process which doubles or triples the amount of yarn on a filling bobbin in order to save hand and machine time in weaving, is not unlike the idea which automatically changes the bobbin to effect like results; consequently, manufacturers are naturally inclined to view the adoption of both methods as superfluous, the increment of cost again becoming a prime factor temporarily to check a just consideration of values.

"However, at the present time we are confronted with the fact that many automatic looms are being served with long lengths of inspected filling, and this acceptance seems to indicate that savings made in spinning, weaving and cloth classification have at least absorbed the cost of preparation in their particular application to this process.

"If the element of chance and change in weaving could be practically eliminated by placing a 3½ pound cone of inspected filling beneath a loom, it would unquestionably be considered the last word in improvement, therefore, it might not be unwise to accept what present achievement has to offer in the combination which approaches this ideal by supplying the magazine of an automatic loom with 24 bobbins that might easily contain 3½ pounds of inspected material.

"Having suggested for your consideration the possibility of increasing plain and semi-automatic loom jobs, provided the filling is prepared in greater lengths for the process, let us briefly consider the effect of this change from an operative standpoint.

"Under common practice a bobbin of 40/1s filling spun with a 1⅜ inch ring would contain approximately 1680 yards, and would run about 10 minutes in a loom, operated at a speed of 168 picks per minute, weaving 36 inch goods; consequently, a weaver running 8 plain looms must change filling supplies 48 times every 60 minutes or once every 75 seconds.

"On the other hand, if the same operative accepted 12 looms served with prepared filling, they would change supplies only 36 times per hour, or once every 92 seconds.

"It is also interesting to figure that if under these conditions a wound bobbin runs 20 minutes, a magazine of 24 bobbins would last 8 hours.

"It is true, if you increase the number of plain looms to a weaver, you increase the warp burden, but does not the same thing hold true in semi-automatic loom weaving? For as I have previously called to your attention, the principle of rewound filling and the principle of magazine supply are identical, it being simply a question of degree; therefore, it follows that if weavers stamp the semi-automatic type of loom with their approval, it is very reason-

able to expect their cooperation by the adoption of a similar time-saving principle. Arguments to the contrary represent fear-thought rather than fore-thought.

"A proof of this contention is found in the present status of the rewinding art, which shows us that within the last three years this country alone has absorbed over 42,000 winding spindles, which were fitted and equipped for rewinding strictly grey filling yarns, and at least 40,000 plain and semi-automatic looms are being served with the product of these spindles.

"Furthermore, eight representative eastern mills and two important southern mills individually operating from 1400 to 5000 looms, wind and prepare all of their grey filling yarns for weaving.

"In the final analysis, assuming that the foregoing statements are accepted this is equally important to bear in mind—that cost of filling preparation applies to less than 50 percent of cloth construction, while savings are estimated on the 100 percent to be benefited.

"I ask you to seriously consider these two facts:

"First, that the value of a proposition of this kind might never be determined unless outside and inside forces temporarily adopt and support the child represented by the idea, and that the greatest stumbling block to progress is the man who has been doing a certain thing a certain way for many years, and will not consider any new method for fear it might change the routine of his peaceful life.

"Second, I wish to emphasize this fact, that serious competitive conditions will have to be met from many quarters, unless neutralized by the adoption of such legitimate aid as may be secured in producing quality and volume.

"Many of you who drive automobiles have undoubtedly at different times driven a roundabout way to reach an objective point, in order to travel on improved state roads, figuring (and quite logically, I claim) that not only would you save time by so doing, but that the slight additional cost for gasoline would be more than compensated for by the comfort and safety enjoyed, and the lessened wear and tear on both the machine and driver. In other words, the direct route is not necessarily the most economical way to travel.

"While this illustration may strike you as being far-fetched, it exactly describes what we find to be a fact in the application of intermediate winding processes to the textile industry."

Mr. Bishop thanked Mr. Foster very cordially for the very interesting talk he had given and stated that he was sure the other overseers present enjoyed it as much as he did. He then asked Philip Wentworth, treasurer of the National Ring Traveler Co. of Providence, who had come with Mr. Foster, if he would not say a few words to the audience.

Mr. Wentworth said that it was the furthest thing from his mind that he should be called upon to speak. He said that he was more than surprised when entering the hall to see such a large number present. This, in itself, he stated, spoke far more than words of how they had appreciated the meetings already passed. Mr. Wentworth advised that he also had the pleasure of being a member of an Association that conducted such meetings in the South, and that in his opinion this was one of the best opportunities he knew of for mill men to get together and discuss problems, also of meeting people who do the same kind of work but in a different mill. He noted from his program of meetings to be held than there was scheduled a meeting on "Developments in the Textile Industry within the Last One Hundred Years." He urged the men to turn out "strong" for this meeting as he could foresee a very interesting meeting on this subject. The meeting then adjourned.

Southern Textile Exposition.

It was announced recently at the office of the Textile Hall Corporation at Greenville, S. C., that the plans for the new addition to the hall, in order to take care of the overflow of exhibitors for the Southern Textile Exposition next October, have been prepared by J. E. Sirrine & Company. They call for a building two stories high, 60 feet wide and 200 feet long. It will contain 16,800 square feet of display space.

The building will be temporary in character, but will be attractive and thoroughly lighted. Three sides will contain as many windows as possible.

Many exhibits of machinery and acessories will be placed in this building.

Contracts have been signed by the owners of the adjoining property for locating the addition very close to the main building on Washington Street. It will be reached by galleries. These will be very short as the annex will be placed about fifteen feet from the hall. It will be so close as to be virtually a part of the main building.

Applications for the Southern Textile Exposition are the largest ever received. They have already run to more than 75 per cent excess over the Exposition in 1922.

Notes About Men You Know.

W. L. Beyer, formerly superintendent and treasurer of the Cochran Cotton Mill Company, Cochran, Ga., has become associated with Stodghill & Company, of Atlanta, manufacturers of sizing materials. He is representing the company in Georgia and Alabama and Tennessee.

W. D. Ingle, southern representative of L. Sonneborn Sons Co., of New York, died recently in Columbia, S. C. Mr. Ingle was well known to southern mill men, as he had for some years been overseer and superintendent prior to becoming associated with the Sonneborn company about five years prior to his death.

Arthur Tousignant, assistant superintendent of the Aiken Mills, at Bath, S. C., has resigned to become superintendent of the Monaghan Plant of the Victor-Monaghan Mills at Greenville, S. C. In this position he succeeds J. C. Montjoy who has been transferred to a similar position at the Victor Plant at Greer, where he succeeds H. E. Bates, resigned.

J. H. Gossett has resigned his position as overseer of weaving at the Anderson Cotton Mills, Anderson, S. C., to become overseer of weaving at the Republic Cotton Mills No. 3, Great Falls, S. C.

J. J. Crowder has resigned as overseer of spinning at the Shawmut (Ala.) Mill of the West Point Mfg. Co., to become overseer of spinning at the new Stark Mill, Hogansville, S. C.

E. E. Lovern has become superintendent of the Liberty Cotton Mills, Dallas, Ga.

Human Relationships in Industry

BY W. M. McLAURINE.

Instruction.

In analyzing the overseer's job, also in discussing the inducting process, it was indicated that instruction is one of the duties and responsibilities of the overseer. He may do it himself, or he may have it done, but it is a responsibility he cannot evade or lightly regard.

In practically every conference up to this time, the need for instruction has been evident, and in the conferences that follow, it will continue to be a factor that will manifest itself in many ways.

The overseer is a practical man. Often he is a man that has grown up with the organization. By hard work, knocks and kicks, picking up a little here and there, he has arrived at success with a wonderful lot of valuable information, but with little knowledge of how he acquired it, and often the case is, he has still less knowledge of how to impart it so that the man who needs to know may be instructed.

There are two possible means suggested for instruction to be given to employees. One that has been tried out is for a regular teacher, that is a regular trained school teacher, to give this work. This has not been a very successful trial. To state it mildly, it has not been a satisfactory trial.

There is too great a gap between theory and practice. It is almost too great an undertaking for the regular teacher to get enough of practical experience to be able to do the work required. It is also impossible for this teacher to do the work when it is necessary for it to be done and under the conditions necessary for it to be done.

Another effort that has been made is for the overseer or the practical man to be trained in the art of teaching so that he may act as instructor in fact, as well as in effort.

It is necessary that two kinds of instruction should be conducted in and around every industry. We may call these two kinds unorganized and organized.

By unorganized instruction is meant that kind that is necessary to be given incidentally and casually throughout the day, week, or throughout the period of employment. Errors and discrepancies that the overseer or supervisor discovers in his daily routine that need correction come under the head of unorganized instruction. It is possible that during a day or week that an overseer or minor executive may find a dozen things that need correction. They all may be different. Instruction will often rectify these mistakes and, in practically every instance, will assist.

This group of information can not be organized so that it can be given a formal setting.

By organized instruction is meant at least two kinds. First, that kind that it is necessary for every new employee to have before he begins work, or is placed upon his own responsibility as a worker. What the nature of that instruction is, will be determined in a large measure by the company policies, plant rules and regulations, and the specific job assigned to the worker. Second, there is another group of information that can be systematically organized and given, and this is information necessary for keeping the employees alert, active, more efficient, ambitious. There are in every factory people who are ambitious and want to learn all about the job or department in which they are working. There are others who want to advance into more responsible positions, if not immediately, at some future date, as yet undecided. They want to be ready when the time comes. This information can be economically and efficiently organized and given in a most profitable way, provided, there is a teacher. It is the purpose of this conference to instruct the group in a few of the fundamentals of instruction and the organization of suitable materials.

I would like to state here before I go further, that "telling" or giving information is not "instructing." Instruction means drawing out, not of your own mind, but of the mind of the learner. To state it in another way, "telling" may agitate only your mind, and not that of the supposed student. An old maxim of pedagogs is, "No impression without expression."

Here is a clear cut statement of the factors involved in the teaching process. First, there is the worker who needs information. He must have it in order to be efficient or promoted. Second, there is the information which he needs, and is unable to get or interpret. Third, there is the overseer who stands between these two factors. He is the bridge that spans the stream. He is the carrier or barrier of information. He has a new job, but not one of production. He has the job of instruction. Herbart, one of the path-finders in our educational evolution, outlined a system of instructing that has been used more than any other system ever suggested. It was doubtless used by others long before his day, and he simply analyzed their method and gave names to the steps of his analysis.

Charles R. Allen, who is today considered the father and leader in industrial education has used four of these steps in his book, "The Instructor, The Man and The Job." I shall use the four as suggested by him. It may be taken for example that we are going to instruct a student or group in a definite subject or assignment.

The first step in instruction is the Preparation Step. In this we try to accomplish the following:

1. Find out what the man knows that will enable him to understand the subject in which he is to be instructed.

2. If he has a background of knowledge sufficient to enable him to understand the subject that is to be presented, the instructor should so direct his thinking, as to bring to consciousness all of this knowledge and focalize it upon the subject to be presented.

3. If the man has not a sufficient background the instructor should delay the presentation of the subject until such condition is present. There is no other alternative for the instructor, than for him to develop this condition.

4. Make the student feel the need for the instruction that he is going to receive. Few people in this practical and strenuous life like to do useless things or seemingly useless things. An animal never struggles so vigorously as he does when he gets hung in a trap. If it will make it any clearer or more forceful, you must get the student

hung, and let him realize that further progress is impossible without this information.

5. The minds of the group to be instructed should be artfully and thoroughly developed to the point where all are eager, anxious and ready for the presentation of the new material.

Thus far it will be noticed that two facts are evident. One is that the method of carrying out these five suggestions has not been discussed. In order to relieve your mind, it will be discussed after the formal steps. The second fact is that nothing of the subject matter of the lesson to be discussed has been introduced. This first step is only what its name suggests, and is one of the more important of the four. Just as it is important for the farmer to thoroughly prepare his soil before he plants his crop, just so it is important for the instructor to thoroughly prepare the minds of the students. It is often remarked that land well prepared for growing of a crop requires greater care than its cultivation, so I am inclined to think that a mind well prepared for the receiving of information and training is half instructed already.

The second step in instructing is the *Presentation Step.* The name indicates what it means. It is the step in which all new material is introduced. There are several directions that should be given here.

1. The presentation step should be the logical and natural outgrowth of the preparation step.

2. There should be no clearly defined line of demarcation between the two.

3. In presenting a subject it must be kept in mind that there are many ways of doing it.

4. The method of presenting the subject must be determined by the reactions of the group in the preparation step.

5. There are also many points of approach or entry into a new subject.

6. The instructor should either direct the thinking of the group to the entry which he wishes to make, or if this seems impossible, or ill advised, he should be able to introduce the subject wherever he finds his group.

7. He is a poor instructor who fails to connect his presentation with the proper entry of his new material.

8. In this step all new material is to be presented.

9. The instructor must realize that the mind works systematically and his new material must be presented in this manner.

10. He should have this material thoroughly analyzed and arranged in order to do this.

11. He must be so versatile that if necessity requires he can dash across his plan and hastily formulate a new one that meets his present needs.

12. He must have his details worked out on paper, or mentally so that he will be sure to cover all points.

If the presentation has been complete and successful, the different members of the group will have the same information and ability on this particular subject as the instructor. This condition is hardly possible. There are possible inaccuracies and misinterpretations, hazy ideas and many things that need clarification. This necessitates that instruction shall now proceed to step Three.

Step Three is known as the *Application Step.* It is here that the errors and omissions of Step Two are revealed. In this step the various members of the group are required to apply the new information in a practical and demonstrative way. Their work is carefully checked by the instructors and the errors are corrected. An effort is made here to clear up all hazy situations or wrong interpretations so that for the second time a check can be made on the instructing process. The instructor should remain in this step until all reasonable explanations and interpretations have been made and he feels that the group has been instructed and the group feels satisfied.

The fourth and final step is the *Test.*

Here each member of the group is placed on his own responsibility and initiative to make a practical application of the information or ability he is supposed to have. He succeeds or fails in this step upon his own efforts.

The chief difference between steps Three and Four is this: In step Three the student has the instructor, who will suggest and advise with him in his work. In step Four, he is alone.

According to Herbart, there is a fifth step which may be of value often. This is known as the Generalization Step. In this part of the recitation the group tries to draw out from the information received, one or more fundamentals which are true, not only in the case under discussion, but are generally true under similar conditions. A kind of fundamental principle.

To illustrate: If the group were trying to devise a means of finding the circumference of a given wheel, when the diameter is given, and they had found out the principle as applied to all of the wheels they had measured, they could logically generalize their findings for all wheels or until they should find themselves in error. How far this is true in practical industrial life, I am unable to state, or how far it may be advantageous to carry this in our instruction program with workers.

Thus far we have only indicated four or five formal steps to be considered in instructing. In other words, we have indicated the job.

The second thing to be discussed is the method or methods of doing the work outlined in these steps. The methods used are *lecture, questions, illustrations, demonstrations,* or *combinations of any of these.*

The lecture method is the most commonly used method. It is also the poorest method of all. It is least effective. It is the easiest way for the instructor to fool himself into the belief that he is doing his job. It is a great deal easier to make one mind work than it is to make ten or twenty minds work. It is a great deal easier to outline a series of lectures and follow them day after day, year after year, than it is to meet a problem as it is and tear it to pieces and solve it. It is an uneconomical method, because the instructor, or lecturer, never has a chance to check his group to see how they are progressing, or where his lecture is weak, or where his class failed to grasp his meaning until he is through. Often he never finds out. If he ever finds it out, it is often too late, and he pats *himself* on the back and says that he has discharged his duty, and if the group failed to get the subject, it is their fault, and not his.

With an average ambitious group of students an instructor has not done his duty until the group is instructed. It matters not what method the instructor uses, or how great his efforts, or how much time he has assumed. The

job of the instructor is to instruct. If a loom runs violently and rapidly and seemingly functions well, but fails to turn out a good piece of cloth, the loom is classed "no good" and another is secured in its place. The lecturer must keep this in mind. It is not his style or effort, but his product, that makes him valuable or not valuable.

This "telling" or lecture method is one of the most common methods used in attempting to give instruction to employees or others who need instruction.

The lecturer generally assumes that the group or the individual has a certain interpretative ability and can understand certain information given in a certain way. He proceeds on this assumption. Sometimes he is right, but often he is wrong.

The instructor must keep in mind that he must take the group as he finds them, and not as he would like to have them. He must build upon their actual experience and interpretative ability and not as he thinks or assumes it to be. He must proceed with his instruction as they are able to grasp it, and not as he *assumes* they are able to grasp it. The lecturer nearly always *assumes* that the group knows more than they do, and can understand more than they can, and can understand more rapidly than they are able. He is generally superior in position or authority and this keeps the group from stopping him for details and explanations and repetitions. There is another fact too that prevents this. The individual is often timid about giving evidence of his weakness or ignorance because of his own sensitiveness and because he fears he will lower himself in the estimation of his superior. There is also a class of lecturing instructors who refuse to be interrupted or questioned about their efforts, and as has been said before, feel that they have discharged their responsibility and placed it upon the group after they have done their telling or lecturing. This method is perhaps the only one that can be used complete with itself.

The second method used is the *Question Method.*

It must be kept in mind that there are several kinds of questions. These questions are classed according to the answers they require, or the mental states they set up.

There is one kind of question which requires the answer "Yes" or "No." This may reveal to the instructor the information he wants, or it may not. It may be a guess where the odds are equally divided. The general attitude of the class and the unconscious expression of the questions may make the student guess right. Suffice it to say that very little mental activity has taken place.

There is another kind of question which calls for information only. Its answer is based on memory and does not indicate whether or not the student comprehends its meaning. I recall this incident which took place in my experience as a school boy. We were studying in Physics, the general property of matter. *Inertia* was listed as one of them. The instructor asked me to define this property. I gave him the verbatim definition—"Inertia is the negative property of passiveness." Five or ten years after that, I found out what it meant. What I am trying to tell you is, I answered his question, but it did not mean anything to me. The fact that an individual may be able to answer certain hypothetical questions is not proof that he compreheends the answers to these questions or is in the right mental state to proceed in receiving the instruction that you desire to give him. There must be some further proof. This type of question is known as the *informational question.* It is necessary to use this at times, but it must be used with care and judgment.

There is another type of question which cannot always be answered by "Yes" or "No," or by recalling information alone. This is known as the suggestive, or development question. It involves thought—a hasty recalling of past experiences focalized upon the question suggested by the instructor, with a view of trying to interpret what he means or has in mind.

Charles R. Allen says it is possible to instruct an individual in any reasonable line and never tell him anything. One of the great philosophers of Greece, Socrates, was the greatest questioner of the ages. A study of his methods, if his subject matter were not so abstruse, would thoroughly reveal what I mean by the suggestive or development question. He would begin with his group and ask questions within their comprehension. These answers and their combinations would suggest other questions. Thus he would proceed with the group, each and all doing their own thinking until, by their own efforts, it would dawn upon them, the great truth he had in mind for them to grasp.

He told them nothing. He simply and skillfully prepared his questions in such a way that their responses would advance them a little each time. Thus, on and on he would go until his job would be complete.

This method has been, and is regarded as the surest and most effective method of instructing that is known. It has two characteristics that prevent its being used to any great extent. It is hard work. It is hard on the group, because they have to think out their own problems. It is hard on the instructor because he has to think so rapidly and intensely to frame his questions properly so that he may have the group develop as he desires. Another fault found with it is that it consumes too much time. Time is a great factor in everything. Today people want information handed to them in capsules. They don't care how they get it; they want it. As long as information is handed out in packages to a needy public, so long will the demand increase. Very few people know how to think. When they need information, instead of getting down and digging for it, bird-like, they throw their mouths open and close their eyes and cry for someone to come and feed them. They swallow it, not knowing what it is or whence it comes.

The development or suggestive question will enable the student to learn how to think, how to take the information which he has and properly follow a line of reasoning until he arrives at what he desires. There is a certain kind of welfare or charity work that begets dependency and paupers. I believe there is a certain kind of instruction that is given that produces mental dependency. The more thinking people there are in an industry, the greater the industry and the less the need for trivial instruction.

There is another method known as *Illustration.*

This method can not be used by itself. It must always be used in connection with either the lecture or the question method. Illustrations form the central body of the method.

Suppose some study of the operations of gears is being studied in an evening class or part-time class and no machines or parts are available for the class to use or ob-

serve. The instructor may use black-board drawings or blue prints or any device that his mind suggests that will illustrate the operations or suggest to the class the operations that he desires to put over. These devices are known as illustrations, and their use gives that type of instruction the classification of an illustrative method. As I said before, this method must be accompanied by lecture or questions.

The fourth and last type is the *Demonstration Method.* As the name suggests, it means instruction on the job and in connection with the machine, appliances or actual operations of these. This method is always used in combination with either the lecture or question method.

There is another method which is used sometimes, but it is nearly always costly and never safe. It is known as the "trial and error method." Often, if seeming success is attained, no knowledge of how it was acquired exists, and whether or not the best information available has been secured.

There are certain cautions that perhaps should be given here, but I am going to assume that your judgment will indicate some of them, however, I shall note a few:

1. It must be kept in mind that in the use of any of the methods or any combinations of the methods that the four lesson steps—preparation, presentation, application, text—must be used.

2. The instructor must have a clear conception and analysis of what he desires to give the group.

3. He must adapt his method to the group and to the teaching conditions in which he is working.

4. He may find that beginning with one method and ending with another is expedient at times.

5. In a course of instruction there may be problems that require several lessons to get the group into the proper mental and skillful state. It is possible to take one hour on each step and even longer.

6. The instructor must remember that the student properly instructed should have the information or ability that he (the instructor) has at the end of the test step. Of course this means information and ability in the subject discussed.

7. The instructor should not attempt to teach too much at one time, or to teach too rapidly.

8. He must use tact and patience. He must always teach in terms that can be understood by the group.

This Chapter can not well close this hurried discussion without a problem.

A reference to the preceding conference on "Induction" will reveal quite a group of suggestive material for subjects for instruction.

I give herewith a skeletal outline of how to prepare a lesson:

Subject .....
Objectives: 1 .....
2 .....
Preparation: Step One.
1.....
2.....
3.....
4.....
Presentation: Step Two.
1.....
2.....
3.....
4.....
5.....

Refer to Step One, and indicate here what method you will use, and how you think you would use it.

Indicate an analysis of your subject here, and your methods of presentation. Indicate some questions you might possibly ask.

Application: Step Three.

Indicate how you would do this.

Refer to explanation of purpose of Step III in this conference.

Test: Step Four.

Indicate the method you would use in testing your instruction to see whether your group is properly trained.

This chapter may seem highly theoretical and impractical to use. Perhaps it is, but I want the conference leader to do three more things before he stops. First, after he has worked out a lesson plan with the group in body assembled, and he has assured himself that he has properly presented the subject, I want him to have each member of the group to select a subject for instruction. Each member should take the suggestions and information that have been developed in the conference and then make for himself, *individually,* a lesson plan, as if he were going to present it to a group. These plans should be brought back for criticism and discussion. This should be material that would consume at least one other conference period.

After the group has carefully discussed each plan, each man in the group should be furnished with an opportunity to try out his plan and his skill to see how efficient both are.

A last group meeting of the subject of Instruction could be spent well in taking some department and definitely outlining a course of study necessary or beneficial for its employees to have.

An analysis of the instruction that a new employee should have would constitute a good study. Either one of these or any other one should be outlined by lessons, indicating the subject of each one, the order in which they should come and the number.

A careful survey of this chapter on Instruction reveals the fact that I have indicated four conferences. One, to indicate the need, the plan and the method; the second to make a plan and indicate the method—each member of the group must do this; the third, each member of the group should try out his plan and method; the fourth, the conference leader, together with the group should make out a course of study in detail for some department or class of employees.

But, you say you will never use this, so why worry your mind about a theoretical, school-teacher program. There are thousands of classes being taught in textile mills today by overseers and others. More would be taught, if there were suitable teachers. The State Board for Vocational Education fosters a plan of part-time and evening school classes in every state in the Union whereby you can not only benefit your mill and your employees, but yourself, and you can benefit yourself financially. Write to them, or to the Editor of Cotton and he will tell you how to proceed.

But suppose you don't care to do this. It has been indicated all along, the part instruction plays in our industrial world. It comprises at least one-third of the responsibility points of an overseer. You have never stop-

ped and studied this thing through to see where you are weak and where you are strong. You have told them, but it did no good. Work these suggestions out in detail and then try an instruction program and see how results change. I do not expect you to stop to make out lesson plans, etc., in your daily instruction on the job, but I do expect for you to keep the general principles in mind and when you seem to fail in some effort, I want you to be able to stop and analyze and see where the trouble is. I think your job demands this of you.

Textile Operating Executives of Georgia Hold Spring Meeting at Atlanta

Those discussion meetings get better all the time, and the spring meeting of the Textile Operating Executives of Georgia this year proved no exception—if its merits are judged on the attendance, interest and amount of helpful discussion it produced.

The meeting was held at the Cecil Hotel, Atlanta, Georgia, on Tuesday, March 18, and in addition to a splendid representation of Georgia mill men there were a number of operating executives from neighboring states present who participated in and listened to the discussion. A morning session, an afternoon session, and the usual "Dutch" luncheon comprised the meeting.

At this meeting a new plan was adopted of devoting one session to carding and one to spinning, and the morning session, at which carding was discussed, was in charge of John H. Howarth, assistant superintendent of the Lanett Mill of the West Point Manufacturing Company. W. L. Phillips, superintendent of the Social Circle (Ga.) Cotton Mills Company, conducted the spinning discussion which occupied the afternoon session. Carl P. Thompson, general chairman of the organization, presided as executive officer and also acted as toastmaster at the luncheon.

The seriatim report of the discussion follows:

The meeting was opened at 9:30 o'clock Tuesday morning by General Chairman Thompson, who called upon Robert W. Philip, the secretary-treasurer, for the invocation. Following the prayer, Mr. Thompson, in a few well-chosen words, welcomed the delegates to the meeting. He pointed out impressively the importance of the positions occupied by textile overseers and superintendents in helping humanity by alleviating and putting down the strife between capital and labor, and in giving the proper leadership to the people in their charge.

Secretary Philip next read an invitation from C. B. Seal, director, The A. French Textile School, Georgia School of Technology, extended to the visitors to inspect the textile school during their visit. He then made some minor announcements and continued:

"We are certainly glad to have with us these visitors from other states. There are some from Alabama, and I think there are others from other states. We are also glad to see a number of Georgia men present, who have not been at our meetings before. We appreciate your attendance and also of course the attendance of you regulars who have been coming to all the meetings, and for the benefit of those who have not attended before I will say that these meetings are informal, and we want you to feel at home and take a part and feel free to say anything you want to say.

"Last night when we were going over this questionnaire we are going to discuss we had a little meeting of our own downstairs that lasted until 1:00 o'clock this morning—just the four of us. If we could keep a meeting—just four of us—going until that hour, we ought to get some good discussion here. We want you to feel at this meeting just the same as if you were talking to a bunch of your own overseers at a mill or just a group of three or four other mill men. The size of the crowd doesn't change

C. P. Thompson, General Chairman.

the conditions at all—but just be the same as if you were discussing things among yourselves."

At this point J. D. Loner, superintendent of the Dwight Mfg. Company, at Alabama City, Ala., responded to the invitation on behalf of the Alabama men. He pointed out the value of informal, free discussion and urged that everyone's opinions be respected and that nothing be done to embarrass anyone.

Mr. Howarth here assumed charge of the meeting and stated the first question for discussion, which was, "Do vertical openers damage the staple so that the strength of the yarn is decreased?"

He summarized some of the replies received in advance to this question. About eighty per cent of these, he said, answered the question in the negative—that the opener does not damage the staple. "One man says: 'The fiber is not materially damaged by the vertical opener, yet each fiber that is broken tends to weaken the yarn.'" Another —"We have had some experience with the vertical opener and do believe it to be an advantage as it breaks the cotton

to some extent and also whips some of the dirt out, and of course that helps to keep the beater blades from getting dull so fast." Another—"With proper speeds there is no damage done." Another says, "We haven't noticed any difference."

In response to a request for experiences with this machine, Frank E. Heymer, superintendent, Bradley Manufacturing Co., Columbus, Ga. said, "I have had about six months experience on our new vertical opener and I have made a very close study of this point—my reason for saying that it does not damage the cotton is that the wings on the vertical opener are far enough apart to whip the cotton against the grid bars and I never have found that the fiber was damaged in the vertical opener. I have looked very carefully because two or three of my friends have claimed that it does damage the cotton. It was told to my superiors that it does damage the cotton and they asked me the same question, but I did not find any that was damaged. We use the grid bars. I cannot say about the perforated screen but I do not believe it will do it with them. Of course in a picker beater the fiber would be held tight and struck but in a vertical opener it is not and I don't believe any damage comes to it."

Mr. Howarth stated that he understood one gentleman was having trouble with the vertical opener curling the cotton. "I have never had that experience—I have looked and looked and looked but I cannot see anything that will do it," said the chairman.

"There is a question on the curling that has bothered me considerably—that is a question of whether it curls or just kind of rolls it," declared James Newsom, manager of the Unity Cotton Mills, LaGrange. "I went around and investigated other mills' openers and they have this same trouble of a rolling effect, but it does not hurt the breaking strength of the staple in any way. I am not exactly clear as to the difference between curling and rolling. I would like to hear some discussion on that point.

"We have the Crighton openers two in tandem and the cotton kind of rolls in strings along in it and if you pull it apart, those strings sort of hold together. Still I find that same effect in the cotton itself and from all I can understand it doesn't materially weaken the strength or effect the fibers any."

Mr. Newsom was asked by W. H. Epps, superintendent, Jefferson Mills, Jefferson, Ga., what staple was used. "One inch," was the reply "Well, do you have any mixed staple?" was the next question from Mr. Epps. "It is just the regular run of cotton; of course there is some short staple in there," said Mr. Newsom. "Well, don't you think if you had some long staple in there it might cause it to curl or roll?" asked Mr. Epps. Maybe it would, agreed Mr. Newsom, but he pointed out that if there were any excessive long staple in it that it would bother them when it got to the spinning room if it was more than one inch.

The speed of Mr. Newsom's beater was asked by W. H. Hames, overseer of carding, Anchor Duck Mills, Rome, Ga. He also asked the amount of cotton being put through. Mr. Newsom said his speed is 700 r.p.m., and that he puts through about 7,500 pounds per hour.

"I think if you will increase the speed you will find it will stop the rolling," said Mr. Hames. "I have found that low speed will cause it to curl."

With regard to this suggestion, W. A. Hunt, overseer carding, Unity Spinning Mills, LaGrange, asked if Mr. Hames increased his speed above standard. That gentleman replied that his speed is 1,050 r.p.m., and he is putting through 60 bales a day and is experiencing no trouble. He said he does not run the vertical opener in tandem as he has found it used singly to be sufficient.

Guy M. Vann, superintendent Eastman Cotton Mills, said that about nine months ago he put in a vertical opener and the breaking strength of his yarn went down considerably. He said he was unable to understand it but that later he cut out the intermediate picker and the strength jumped back up. "I do not understand why it was down with the intermediates and the vertical openers in there," he said.

Mr. Heymer couldn't see why the breaking strength went down either if the cotton was cleaned thoroughly. "With reference to the rolling mentioned by Mr. Newsom, I find on the cage section or cleaning trunk it looks straight but after it passes there it rolls. After we dye it, however, it does not give us any trouble."

"May I ask Mr. Hames whether after he increased to 1,000 r.p.m. on his vertical opener the breaking strength increased," requested Mr. Newsom. "Didn't have any affect on it one way or the other," answered Mr. Hames.

The chairman here presented the next question, which was—"What advantage do you get by opening cotton and letting it stand for one or more days before feeding it into the openers?" He stated the consensus of replies received indicated it depended on the amount of room available for this work—that it was everyone's desire to do this if possible, but that many were handicapped because of lack of sufficient space. Among the replies received to this question were: "It is a great advantage, gets fluffy can be cleaned better, three days is best;" "it ages and permits the cotton to regain more of its natural state"; "we obtain a better mix by so doing"; "the cotton will expand and clean better"; "we get more even numbers as the atmosphere dries the damper or greener bales, therefore we get more stock and less moisture"; "comes back more to a lifelike shape"; "more uniform work and better cleaning."

The answer selected by Mr. Howarth as best illustrating the advantage was—"It gives me a *conditioned* cotton."

Mr. Howarth here described his own system of opening at Lanett. He runs 800 bales of cotton a week, he says, and "we open up 25 bales and take an average bale of the different grades. If it is compressed cotton we snap all the ties except the two end ones and put it away and when we take it out it is opened up considerably so that it is about the same as the larger bales." He explained, however, that he did not claim to have the best system, but was doing what he could under his conditions of space. "I had rather open up a whole day ahead but I can't do it because I haven't got the room." He called on Mr. Phillips, of Social Circle, to describe his method.

"We open up our cotton fifty bales at a time—which is a week's supply—and we lay the cotton around the opening room and lay all we can and take a small batch off each bale and roll it up, and lay it on the apron. In this way we can get about fourteen or fifteen bales on at a time and as it empties off the apron it unrolls. Then by the time we start back around on it it is fluffy for about eight or ten inches from the top of the bale."

General Chairman Thompson stated at this point that "I have always been interested in opening cotton and I have read some reports, I believe in Mr. Clark's paper, about how they do it in England. I would like to have

Mr. Clark tell us briefly how they do it in England."

The gentleman called upon, David Clark, of Charlotte, made the statement that "the mills in the South spend at least a half a cent a pound more to spin yarns than they do in England by reason of the fact that we use double roving where in England they use single roving." This, he pointed out, was a result of "how they do it in England." He said that with the English, ageing and mixing the cotton is a scientific thing. "I don't think there is a mill in England that would keep a superintendent one hour who used cotton that he had not had in his mixing bins at least three days." He pointed out that not a mill in England runs yarns coarser than 40s with double roving, stating that on a trip to that country Stoney Drake had found many mills spinning 50s and 60s of fine quality out of single roving.

"They spend their time and their care and their study on the opening of cotton," Mr. Clark continued. "The English idea is that no two bales of cotton have exactly the same amount of moisture and that by putting these in the same bin they will in the course of several days become uniform, and then, when they start on them, they will be in a uniform condition instead of having dry cotton up against damp cotton."

Southern mills are spending at least a half a cent a pound unnecessarily in making yarns because of a belief on the part of the superintendents that it is necessary to use double roving on 20s and above, said Mr. Clark, who stated he knew mills spinning 40s out of single roving that is just as good as the other. He pointed out that it costs very little to work cotton in the opening room and very little to mix it. "In the English mills mixing cotton is a science. They take their cotton and age it and condition it. The cotton is uniform in density and moisture. Here we are sitting in the South making yarns to compete in the world trade with England's and losing not less than a half a cent a pound and perhaps more simply because we don't know about mixing and opening cotton."

Mr. Howarth agreed with Mr. Clark, relating an experience with his own father who was an old English yarn man from England. Mr. Howarth said he had just taken his first job as assistant superintendent and that he was mixing his cotton pretty much in the same manner as he is doing it now, although he did not use so much, yet his father told him, "Boy, you'll never make yarn taking cotton that way from the bale." "I asked him what to do and he said, 'Give it to me,' and I did, and he built right on the end of the opener room or, rather, had it built, a wooden shack and he opened practically a week's run and had the men lay it in layers. Then he had two big forks made to pull the cotton out with. I was not in a position to know whether it made any difference or not but my superintendent said it did make a vast difference in making yarns as high as 40s."

D. W. Anderson, manager and superintendent, Pacolet Manufacturing Company, New Holland, Ga., asked whether the English use the blowing system or have the cotton fed directly to the opener. The reply was that most of them use the Crighton opener.

Mr. Anderson said he had never been able to find out "whether the English use the blowing system. Probably some of you will take issue with me but I have an idea that where you have the blowing system, that, in a large measure, conditions your cotton. That is the object of the blowing system.

"I believe," continued Mr. Anderson, "that a mill that buys cotton in the fall and has an accurate system of grading and figures out the average grade of cotton that they have purchased for the entire season, then each day picks out that average grade—for instance, if you are running strict middling 1 1/16 inch, pick out each batch that you put down, then take down fifteen or twenty bales and strip them out and do that mixing exactly the same every time, and then feed those fifteen bales the same and put them through your blowing system and Crighton opener or this Murray outfit (we have the Murray in one picker room and the vertical opener in another and can't tell any difference; in fact we get a little better results out of the Murray)—the point I am making is that that cotton is in good condition and then going through this air, the air is a conditioning arrangement. We know the English mills have been very backward in adopting modern machinery; in fact you find thousands and thousands of plain looms—"

"It's the unions that make that," interrupted Mr. Clark.

"Well, perhaps they do this, too," said Mr. Anderson, "but I would like to know whether they use the blowing system.

"Another thing to consider is that the English use compressed cotton all the time—they can't get soft cotton—and in addition to that, the cotton is on the shipboard, and when it gets to them it is in a compressed state and contains a good deal of moisture." Mr. Anderson concluded by stating he spins 22s warp and 26s filling with the arrangement explained by him.

At this point Claude R. Brown, superintendent of the American Textile Company at Ateo, Ga., demonstrated and described an arrangement he has for mixing and cleaning cotton. This device has a revolving apron with intermittent sets of spikes which operates over a trough device above the hoppers. This trough has an opening just above each hopper and from each of these openings hangs a canvas sack which extends down to the level at which he wishes to keep the cotton in the hoppers. Also located in the bottom of the trough between the hoppers are sets of grids. As the condenser discharges cotton onto the end of this trough the spikes in the revolving apron catch it and drag it along over a set of grids to the opening over the first hopper. The cotton falls down this opening until the proper level in the hopper is reached when the sack like funnel fills up even with the trough and will accept no more cotton. Then the surplus cotton is dragged along by the spiked apron over the next set of grids and on to the second hopper where the operation is repeated. This movement is continued until all hoppers are taking only their normal feeding quantity which allows the cotton to be divided among the several hoppers as their needs demand. Any excess cotton is discharged from the end of the trough to the floor or to a bin as is the case with other distributors. The grids between the hoppers provide additional cleaning for the cotton, the dirt falling to the floor.

Mr. Howarth added his approval to the machine, stating he had seen it in practical operation and in his opinion it was just as much a cleaning agent as a mixer.

The next speaker was Henry D. Martin, superintendent of the Griffin Manufacturing Company, Griffin, Ga. "You

know, gentlemen," he said, "I have had a long experience North and South, and my experience in opening cotton has been from that of opening one bale at a time up to one hundred bales of cotton at one time, and if I had my choice I would always open one hundred bales instead of one or less than one hundred.

"When our friend David Clark was speaking I was very much enthused over what he said because I believe every word he says that oftentimes we are using cotton of a higher grade than we might use to spin the same numbers if we paid more attention to the opening of cotton. I do not know of any one subject I have written more about than opening cotton and it would pay every overseer, every superintendent, every manufacturer, to pay a great deal of attention to the opening of cotton."

J. L. Bowles, of the Fairfax Mill, West Point Mfg. Company, discussed the matter of Crighton openers. "We have two English Crighton openers in our mill," he said, "and we use a fan to pull it through the flue, and it was built for that purpose. The English may have different openers but they do not ship them over here."

"We run three different lengths of cotton," said S. H. Harris, foreman of carding, Standard-Coosa-Thatcher Co., Piedmont, Ala., "which are 1⅛, 1 3/16 and 1¼. We lay down twenty bales a day and try to lay these down in the afternoon so they can set overnight. Then we run it through a bale breaker and through the Murray cleaner, blow it 300 feet through a condenser and then an ageing bin. On this long staple cotton we had a tendency for it to roll or 'string,' but now since we let it set in a bin a night and part of a day we have noticed quite a bit of this has disappeared. It lets the large leaf go through without breaking it up."

In summing up the discussion, Mr. Howarth said, "I rather think it is the consensus of opinion that by opening cotton, by ageing it, it puts it in proper condition to get the best advantage all through the mill." He then took up the next question: as to what is the best method of "starting new cotton into the mill in the Fall, provided you have no old cotton on hand to mix with the new?" This question developed a marked difference of opinion. In explaining it, Mr. Howarth pointed out that it means running new cotton through without any old cotton mixed with it. He explained his method by stating, it is practically the same as it is for a compressed bale—that is, as soon as the cotton comes, the ties, all except the two end ones, are cut and the cotton stands until it is used.

Mr. Howarth summarized the written replies to this question, among the answers being: "Open up several days before using;" "start samples and watch it for readjustment"! "the best method is to run several bales of new cotton through before the old cotton is used up and take weighings so as to find the proper weight of laps to run"; "never mix old cotton with new and never have any trouble with same"; "open the bales in the warehouse and scatter and let lie for three or four days before using." Mr. Howarth pointed out that the general opinion seemed to be that it is best to open up ahead and let the cotton age.

A. E. Massey, superintendent, Thomaston Cotton Mills, Thomaston, Ga., was of the opinion that this question of new and old cotton reverts back to the question of moisture content. "I don't know how many know it," he said, "but it is a fact that if anybody will go into it he will be surprised at the moisture content of raw cotton. It was a surprise to me and especially on long cotton, staple cotton, as we know it. Egyptian cotton runs considerably above American, but even on American a man has a surprise coming to him as to what he actually has—and I think that covers the whole question of new and old cotton."

J. W. Hames, superintendent of the Exposition Cotton Mills, Atlanta, asked Mr. Massey if he had any data on what he had found as to moisture content. Mr. Massey replied that "the moisture content of average American cotton for eight months, runs from five to seven per cent actual moisture in a bale of cotton." As to running new cotton alone Mr. Massey said that "in my thirteen years at Thomaston I have never had to start new cotton but once and I am praying I will never have to do it again."

The chairman here called on Mr. Phillips, of Social Circle, whose answer on this question was the opposite to the general run of opinion.

"For the past three years," said Mr. Phillips, "we have been running all of our old cotton out and starting absolutely on the new. Up until three years ago I was always taught and raised up on the idea that you had to mix the old cotton with the new, and I did, until I ran out and I had to run the new. When we started to use the new cotton—after we let it lie as long as we could—we got better results than we ever did before, so the next year I ran out all the old cotton and found the same results, and the past year we did the same thing. We find that if we get the old cotton and new cotton together it doesn't mix as well. One may contain more or less moisture than the other, but if we let the new cotton stand as long as possible and run it separate, the tops of the bales will condition and in a few hours it will assume its natural condition. We don't mix it and I don't think we ever would again."

A. J. Todd, overseer carding, Unity Cotton Mills, LaGrange, expressed it as his observation that several years ago, when farm labor was more plentiful, the new cotton was hard to run, but that now, since farm labor is more scarce, the cotton becomes more matured before being gathered. "Eight or nine years ago," he explained, "it was practically impossible to run new cotton. It was picked too green and ginned too green and it was too green to run. I think that it is because of the shortage of labor on the farms that in the last few years cotton has become more matured in the field and is easier to run."

An experience similar to that of Mr. Phillips was related by Mr. Heymer: "My superior allowed me to run out of old cotton and we had to buy cotton," he said. "My carder and spinner threw up their hands and said they couldn't run it, but I just let my imagination run a little bit. I figured if it was just a case of too much moisture I would get that out in the warehouse, and I let it stay in there for three days with all the bands off. Then I had it carried in trucks into the opener room and I was greatly surprised how nice that cotton ran. I don't know what really happened but I certainly experienced one of the greatest thrills in my life—I convinced my carder and spinner that we could run new cotton without running it mixed."

Capt. E. Lang explained here that in discussing English practice one feature had been overlooked—that the

temperature in England is quite different from what it is in the southern states. "As Mr. Anderson remarked," said Captain Lang, "this cotton in England accumulates moisture in shipping and when it gets to the mill it has to be seasoned. My father used to open up about 200 bales, putting it in bins which were partitioned off and then they had a leverage to bring that cotton forward so they would not have to run back into these bins to get it out."

This cotton was brought direct to the Crighton opener, continued Captain Lang, and he said these were about the same as the Crighton openers used here.

Charles E. Pearce, agent of the Tallapoosa Mills, at Tallapoosa, Ga., was of the opinion that the question of running the cotton resolves itself into a matter of dollars and cents. "Any man had rather use old cotton than new cotton," he said, "if we can get the cotton for the same price. In the new cotton we are paying moisture charges. My experience has been that it resolves itself into a matter of cost—that we lose about a half a cent a pound difference in the weights on new cotton. Therefore it resolves itself into a question of the differences between the two cottons. If the market is not different between the old and the new, we take the old."

Going to the fourth question, Mr. Howarth asked, "Do you believe it pays to install grids similar to the English cleaning trunk in the suction line?" Most of the written answers received, he said, favor the grids in the suction line. He added that he is putting in a section to try it out at Lanett—that his carder thinks it is a good thing as "we can get out a lot of mote, leaf and dirt from the stock, saving work on pickers and cards." He read the answer of another man as follows:

"If you could install grids without increasing the fan speed, which would be necessary to pull the cotton through over the grids, better results could be obtained by installing them. The best results obtained from any cleaning trunk are secured by the cotton going slowly over the grids. If the draft or air current could be regulated so that it would give the cotton a rolling motion over the grids, much better cleaning would be obtained than where the draft is so strong that it sucks the cotton through." Other answers were: "From what I have seen of them, I think they are very good"; "depends on whether you use clean or low grades; if low grades, yes"; "if you have no other trunk cleaning system it pays to a limited degree"; "we are installing five sections of English cleaning trunk to be used in connection with the vertical openers."

In discussing this Mr. Heymer said, "When we installed the vertical opener we omitted the cleaning trunk, but after deliberation we decided we had better put some in. We installed five sections of the trunks, and we get one-fifth of one per cent of motes and dirt after it goes through the vertical opener. We are getting the highest percentage ever, and consider it one of the best investmnts we have ever made. The highest I ever have secured was .28 of one per cent."

Mr. Martin, of Griffin, agreed with Mr. Pearce concerning the matter of costs. He pointed out that fiber could be cleaned and worked until there was nothing left "but the hole," but it is necessary to have some cotton left out of which to make the goods. He related an experience in a Fall River mill making bedspreads when cotton was coming bad. He said he saw bale after bale where it was difficult to tell whether the cotton was hayseed or sawdust or whether it would be better to run just the cotton, or bagging, cotton, and all. He said they did not use the grid system in the trunks, but after the bedspreads were made and bleached, the dirt came right out and the goods were beautiful. He pointed out that it would have been a breach of judgment to have spent money and effort in cleaning the cotton in the preliminary processes when it could come out later on anyhow.

"I remember the time Mr. Martin speaks about in Massachusetts," added Mr. Howarth. "I ran some cotton up there that I was almost certain came out of old matresses used during the Civil War!" However, Mr. Howarth explained, that time has gone by and the customers are becoming more and more strict in their requirements.

Mr. Phillips, who runs a sheeting mill, was interested in what Mr. Martin said. "I would like to ask Mr. Martin what the breaking strength of those goods was?" "I don't just remember the figures," said Mr. Martin, "but it was excellent."

"Well, would it pass on today's market?" asked Mr Phillips.

"It did," said Mr. Martin, "and we had the name of making most excellent yarns and could sell all the surplus."

Mr. Pearce reiterated his opinion that the matter resolves itself into a question of dollars and cents. "There are certain classes of work that it would be unnecessary to take out so much waste when it isn't required; 35-cent cotton and 15 per cent waste makes the cost of raw material pretty high. It's the same way with carding, setting the cards up and cleaning out cotton to get the trash out. I am making a class of yarns for the plush trade which is a pretty particular trade and if we card too close we lighten our profit."

C. K. Lawson, overseer of spinning at the Tallapoosa Mills, said, "I do not believe that grids in the suction line pays. The cotton is not open enough to get the dirt out. We use cleaning trunks but the cotton has been opened up by the openers."

"I agree with Mr. Pearce," said A. E. Strange, overseer of spinning, Berryton Mills, Berryton, Ga., "but I think that when it becomes necessary to clean the cotton better it should be done. Some time ago we had some trouble with a hosiery mill at Nashville and we got a kick on almost every train from Nashville that the yarn was bad and that they couldn't use it, and we could not very well tell from the way they wrote the letters what the trouble was, so the superintendent told me I had better go over and look the trouble up. The mill was owned by Mr. Jacob May. I told Mr. May what I was over there for and he carried me into the mill and picked up the yarn and said, 'Now you see that?' 'Yes,' I said, 'what seems to be the trouble?' 'Well, you see, we buy yarn, we don't want seed.' So you see we have to take the seed out and had to install some cleaning system."

John F. Long, superintendent Beaver Mills, Douglasville, Ga., said he thought the cleaning trunk was a fine thing, but did not have one in. He stated that his biggest trouble was in keeping neps out of the yarn. "We are using 1 1/16th-inch cotton on 30s warp and 40s filling. We get a splendid breaking strength. This western cotton is dirty and doesn't look like it has any body, but it has; it comes right up to 1 1/16 inch and sometimes better but I cannot get the neps out."

"I would suggest that he grind his cards," said G. J. Jernigan, overseer carding, Crown Cotton Mills, Dalton. "We keep our cards ground and we have recently put in 28 new fillets," answered Mr. Long. "The Beaver Mills are supposed to have one of the best card men on the road and he has been with us and he and our overseer and the card grinders are putting their all in on these cards. They are ground and kept sharp."

Picking.

The next question discussed related to picking: "What settings on the blade beaters and Kirschner beaters do you find best for obtaining breaking strength? For obtaining cleanliness? Why?"

Mr. Howarth read the answers received, as follows: "¼ to ⅜ inch"; "3/16 to ⅛—closer setting injures staple"; "blade beaters on breakers set to ⅜ inch, Kirschner beaters on finishers set to 3/16. These give best results for breaking strength. Have never set for cleanliness alone"; "¼ inch at top, ⅜ inch at bottom, ¾ inch space between where it can be got"; "to the feed rolls, ¼ to ⅜ on the blade beaters, and ⅛ to 3/16 on the Kirschner—the greatest part of cleanliness comes from the mote knives and draft conditions"; "set blade beaters 3/16 inch for cleanliness—a little wider setting would doubtless result in stronger work, as the fiber would not receive such severe treatment"; "for breaking strength, 3/16 inch."

Due to the press of time, Mr. Howarth asked that only the out-of-ordinary instances he discussed under this question. David Clark, of Charlotte, said: "I would like to call attention to one answer. I cannot see how setting the Kirschner beater can break the staple. At the Anniston meeting some of the men were there and one of the best carders in the South said he was setting his Kirschner beater 3/16 of an inch. After the meeting I asked him if he considered himself a good carder. He said he did, and I asked him then if he would not go and set it as close as he could without hitting the grid bars. I saw him later and he said it did not hurt his stock. The Kirschner beater has points on it and does not affect the fiber."

"I would like to say on setting beaters that we have the Kirschner beater on openers and set these to the thickness of a rule to prevent the spikes from hitting the roller," said James Oates, overseer carding, Griffin Mfg. Company, Griffin, Ga. "On the blade beater we have them on the breaker and set them half the thickness of the rule unfolded. I went with the Griffin Manufacturing Company four years ago and found that something had to be done. We had in the intermediate the three-wing blade beater and we discarded this and also discarded the two-wing blade beater in the finisher. Finally we installed the Kirschner beater in the finisher and intermediate. We were about two months doing this changing and I set those beaters as close as I could get the spikes to the feed roll without injuring the spikes.

"The points of those spikes have a combing action, not a beating action. It certainly was a wonderful improvement when we discarded the blade beaters and installed the Kirschner and set it as close as we could. We reduced our lossage in the picker room in motes about 3.1 per cent on the new system. We have had that system running something like two years and eight months and we are getting remarkable results. Of course our mill is on pattern goods—we run every color that can be thought about—and we get wonderful results with those settings."

Next taken up was the matter of ball bearings on the aprons. The opinion on this varied. One man writing said, "Have one line of ball bearings on aprons. These have been on about two years and aprons have given no trouble in any way. We have sprocket drive on all aprons and cannot see that laps are any different on the ball bearing line, but the sprocket drive did make a difference, the laps being evener."

"Holds weights better" was the recommendation of one man in writing his answer to the questionnaire. Others answered succinctly "Yes" or "No" to the question of whether there were any improvements shown.

The first man discussing this was Mr. Heymer, who said he is studying the matter and should like to have some information on it. Mr. Hames, of Rome, said, "I get some evener laps with them. We had more or less trouble with the idler belts stopping and this helped, and naturally the aprons run with less friction and we have less laps to set back." Mr. Jernigan said that ball bearings relieve the cone belt but that he could not see any difference.

At this point Secretary Philip read a statement from a letter relating to ball bearings as follows:

"Ball bearings on aprons and evener motions of intermediate and finisher pickers have come into very general use. Their purpose is to eliminate the friction in parts drawn by the evener cone belt so as to reduce the slippage of this belt as much as possible. Most of the trouble with uneven laps is due either to cone belt slip, or to stretching the laps on the front of the machine, which I shall refer to later. Some of this trouble is caused by the belt shifting arm being sluggish in its action. Minimizing friction in the train of rolls pulled by the evener belt will reduce the belt slip, particularly as the load on aprons is constantly changing as laps run out. With ordinary bearings this change of load results in a corresponding change in friction drag. With ball bearings the friction is nearly constant regardless of load, so that changes of lap weight do not affect the belt slip."

"We have our pickers partly equipped with ball bearings," said Mr. Loner, of Alabama City, "on the aprons and cone belts. Our boss carder, Mr. Turner, is here and I will ask him to explain what we have found out by using them."

"I have 21 finishers equipped with ball bearings," responded Mr. Turner, "on the aprons and eveners and the thrust bearing on the cone belt and rocker quadrant bearing, and I find that I can get a good deal more even lap. I do not have to set back so many laps. And the cone belt lasts practically indefinitely. I have some that have run four years and they look as good as the day they were put on. I use the English belt. I believe that ball bearings pay for themselves in conebelts and even laps."

"What percentage of laps did you save?" asked Mr. Heymer.

"I saved eighty per cent of what I was setting back," replied Mr. Turner.

"Do you take a yard by yard weighing, and was it evener?" asked Mr. Howarth. "Yes, sir," said Mr. Turner.

At this point Mr. Philip read another statement with regard to the use of ball bearings on the loggerheads of pickers:

"Nearly everyone has experienced trouble with badly stretched laps. Even where knock-offs have been carefully set, and the calender rolls are apparently delivering the

right length of lap, there will often be trouble with laps being a yard or so too long. A good deal of this is due to the small rollers in the lapheads or loggerheads sticking. There are two of these rollers in each head. One is larger than the other, and sits just over the lap rod on which the lap is wound. The other is merely a guide roll, and is of little consequence. The top one, however, carries a good load, and if pulling hard due to poor oiling, or if stuck, the lap rod is very hard to turn, and it is necessary to exert an excessive pull on the surface of the lap to make it turn. This pull naturally stretches the soft outer layers of the lap, and makes the laps soft and puffy. To try to overcome this puffiness, more friction is often applied, which simply aggravates a bad condition. The extra friction simply causes the fluted rolls to bite deeper into the lap, and the depression they make in it adds to the stretch caused by pulling.

"A roller with ball bearings mounted inside of it has been designed to stop this trouble. The ball bearing roller is simply put in the loggerhead in place of the old plain roller; all such rolls being made interchangeable for different kinds of loggerheads. The ball bearing rollers turn with practically no friction at all, so that a very firm, compact lap can be made with a small amount of friction on the let-off. These rolls need greasing only about twice a year, so that they give no trouble, and require virtually no attention. They are also perfectly clean, and allow no oil to run down on the lap rod and get on the lap."

The chairman then took up the next question for discussion—"How much difference in the variation in the weight of the finished roving have you found by using finisher laps with two pounds variation allowed in comparison with laps with one pound variation allowed in the total weight of the lap?"

David Clark, of Charlotte, made this statement in connection with this question: "I would like to state an incident—at the recent meeting of the carding division of the Southern Textile Association we went into this matter very thoroughly, and came out with great indecision. We found laps varying from four to six yards and we found sliver varying greatly after stripping and we found that two cards set side by side would make different weights of sliver and we began to wonder how we ever obtained even yarn at all.

"A great many mills have had a method of running laps over that varied over one-half a pound either way. Within the past 30 days I have been in a mill of 150,000 spindles that had less than three days' accumulation of goods on hand—at no time have they ever had more than two weeks' stock; they sell their goods and they make a remarkable product. This is the Naumkeag Mill. And yet they never run a lap over. They make the best selling white sheeting in this country—the Pequot—and they wouldn't think of running a lap over.

"I spent three hours in this mill examining their processes trying to find out why they lead the country on this product. The overseer of carding took me through and I asked him what he attributed the success of the mill's product to. And he showed me that they run evener drawing and they claim that is what does it.

"The overseer of carding told me that they occasionally weigh a lap to see how it is running but they do not set any back. We are spending money to run our laps over and they are getting better results without paying any attention to it."

"We allow a half-pound variation," said Mr. Long, of Douglasville. "A lap that varies a half a pound we mark. We have the racks on our cards painted red and blue and we follow the variation on the laps all the way to the drawing. When we get to the drawing we have three with the cans marked blue and three with the cans marked red, and we do not have any trouble with evenness."

Mr. Heymer said he could see where this could be done in a white goods mill but asked if it would apply in a colored goods mill, where on the drawing—making a heather, for example—there would be two ends of one color, two of another and two of a third. The opinion of R. A. Field, general superintendent, Newnan Cotton Mills, was requested on this and he said he did not see how the variation would be great enough to affect the color. Mr. Field said that he allows a half-pound variation in his laps.

The next question was, "How often do you grind your cards?" There was no discussion, but the replies received to the questionnaire indicated a general preference for "once every four weeks," although one man said he grinds his once every sixteen days. Mr. Howarth stated that the answer "Grind every four weeks or oftener if needed" about summed the thing up.

"What percentage of variation do you have in card sliver before and after stripping?" was the next question. The replies to this varied greatly, depending, it seemed, on the amount of time allowed after starting the card up before weighing.

"Now I will tell you something I have learned about this," said Chairman Howarth, "and that is that the size of the trumpet has a great deal to do with it. In discussing this I would thank any gentleman who has had any experience with regard to the size of the trumpet to make a statement in that connection as to what he thinks it had to do with the variation of his sliver. Has any gentleman anything to say?"

Mr. Epps, of Jefferson, stated they had had some trouble. He explained they have four different makes of cards in their mill and were having difficulty in getting even numbers. "The overseer came to me about it and we got to experimenting and found the sizes of the different trumpets varied. I would be glad to have Mr. Sheridan, who is here, tell you about it," said Mr. Epps.

E. L. Sheridan, overseer of carding and spinning at Mr. Epps' mills, responded: "Our trumpets varied from ½ inch opening on some to 3/16 on others, on the different makes of cards. We ordered some trumpets and they came the same way. We took these trumpets and had them filled up and welded and bored out all of them to 3/16 of an inch, and we found that our variation decreased considerably. There was a variation of about 25 per cent in the weight of the card sliver on the different makes of cards, but after we got our trumpets all bored to the same diameter, we found anywhere from five to eight per cent variation."

"We weighed the sliver before and after it went through the coiler head," added Mr. Epps, in explaining how they arrived at the cause for the trouble.

In regard to variation before and after stripping, Mr. Jernigan, of Dalton, said he had made some experiments and found that it averaged around fifteen per cent.

D. G. Reid, superintendent, New England Southern

Mills, Hogansville, Ga., raised a question in this regard, saying, "It depends entirely on how long you wait after you strip before you weigh the sliver. If you strip and get your end right up it will vary considerably. We let ours run several minutes and we get ten to twenty per cent."

"The consensus of opinion seems to be that it is about twelve to fifteen per cent," said Mr. Howarth, "so we will pass along:

"What is your experience with different settings on the feed plate to licker-in, with reference to breaking strength and cleanliness? Does a light or heavy lap affect the setting? What setting is best on the flats to cylinder?"

This question brought the statement from Frank Heymer that he had always been taught to set flats 12 at the back and 10 at the front. However, he quoted an article, the writer of which recommended setting to a 7 all the way around. He wanted to know why this was suggested. No one seemed to agree with this as a setting.

James Oates, of Griffin, said, "At our mill we set our back flats to 12 first and second, third to 11, fourth to 10, and finish up with a 9. The reason we do this is that it is on the same principle as the system we use in the picker room—opener, breaker, intermediate and finisher. I tried setting with a 10 all the way around but I had more neps than I do with my present setting. It gives a wedge shape opening through which the material works as it comes to be delivered to the doffer." Mr. Oates added they had complaints of specks and neps some three years and seven months ago and since instituting this setting then they have had much less complaint.

Mr. Howarth said he thought 12 and 10 is best, and asked Mr. Hames, of Atlanta, what he thought about it. Mr. Hames passed the question on to his overseer of carding, Ed Chandler, who said, "We find we get mighty good results with 12 at the back and 10 at the front. We have some neps, of course, but I believe I've got my first mill to see that doesn't have some."

"Did you ever try any other setting?" asked the chairman.

"Oh, yes," replied Mr. Chandler. "But I always prefer to use 12 on the back and 10 at the front. I haven't gone to 11 and 9. There are several reasons why a fellow can't use a 9. Someone said he might use a 7. I haven't been able to do this. By using 12 at the back and 10 at the front, as the gentleman from Griffin says, you have got a kind of wedge shape opening between the flat and the cylinder."

Mr. Lawson pointed out as an argument against the close setting the fact that the cylinder often takes bunches of fiber from the licker-in and if these struck the flats at a 7, or something like it, the result would be more fly.

Among the answers read by Chairman Howarth regarding this question were:

"Depends on the grade and staple of cotton." "Feed plate to a 12 is best for most any class of work. "Where the licker-in is in good condition and sharp, a 10 is all right. If dull, 7 is best. You can set the card doffer to a 5 while carding a 10-ounce lap and change the lap to a 16-ounce lap, leave the settings as they were with a 10-ounce lap and you will face wire. Top flats to cylinder, 10."

Another—"Weight of lap affects the setting. We use an 11¾-ounce lap. We find about 12 gauge gives very good results for cleaning and lowers breaking strength very little. Greater distance we find will slightly improve breaking strength but reduces the cleaning, so have adopted a 12 gauge on our regular work. We try to set our flats close as possible not to rub, running 75 to 100 pounds per card per day."

"Have you made any experiments in decreasing or increasing the speed of the licker-in? If so, what results were obtained?" was the next question, but was not discussed. It seemed not many had made experiments one way or the other. Among the answers received were:

"Tendency is to slow down."

"Yes, I increased the speed and appeared to get a smoother web of sliver, but never could get the breaking strength to show up satisfactorily."

Another—"We are carding 210 pounds to the card in 11 hours, and our licker-in runs 388 turns per minute. No other experiments."

"I want to talk with that last man," said Chairman Howarth, "not because I doubt he is carding 210 pounds per day—for I'm doing it myself, almost."

The next question was, "What is your system of oiling and cleaning cards?" but discussion was not held on this due to the lack of time. The chairman read the following written answers to the question, giving different systems:

"Flap off strippings; wipe cards once a week."

"Oil all parts twice each week, fast moving parts once each day. Mop off once each day, fan off two or three times each day, wipe doffer cover and coiler head often enough to keep clean. Blow off the cards on stopping off for the week."

"Keep clean by brushing as often as necessary."

"Have one man do all the oiling on the cards. Strip out three times each day, and clean off cards and sweep up every time we strip cards."

"Oil fast bearings twice per day. Mop off once per day. Wipe off fronts four times per day."

"Oil cylinder and licker-in bearings daily. All slow moving parts weekly. Brush off cards twice daily. Wipe fronts every two hours, thorough cleaning with compressed air weekly."

Drawing.

Methods of oiling and cleaning drawing frames formed the next question, but discussion on this was waived also. Among the replies read by Chairman Howarth were the following:

"Oiling done by one man who is held responsible. Oil fast parts twice each day. Slow parts once each day. Rolls once each day. Wipe off tops of frames once each hour. Wipe weights once each week. Pick clearers four times each day. Pick bottom rolls twice each week. Clean off backs and sweep behind cans once each week. Wipe off coiler stands once each week."

"Blow drawing frames off every time cans run out; oil rolls three times each week; fast running parts once a day."

"Oil all parts twice each week—heads, loose pulleys and shaft bearings once each day. We have 128 heads of drawing and clean top and bottom rollers on 32 heads each week. Frames are cleaned off when creels run out."

"Clean drawing twice per day and oil twice per day. Take frames down and thoroughly clean every three

months. Clean clearers every doff both bottom and top before starting."

The chairman next asked: "Do you creel your drawing all at one time or as the cans run out? Which is better? Why?" He reported that the written answers ran something like this: "As cans run out, better results, easier to run." Some of them creel all at one time. A great many as the cans run out. One creels half at a time. One says "Creel drawing as it runs out"; another, "Creel as cans run out; drawing will not get behind when you creel as cans run out." Another—"best way to creel is half at a time; that is, if six into one, change only three at a time."

Called upon for a statement, Mr. Martin, of Griffin, said, "I should think there would be a great deal of advantage in that in a white goods mill where the work is all the same. A great many creel all at one time. The danger in creeling all at one time is that the top of the can would pull under an easier tension than the sliver coming from the bottom of the cans. Therefore, creeling three ends at one time, I should judge, would make a great deal better work than creeling all at one time. On colored work it is hardly possible to adopt any other plan than creeling as the cans run out. That will average very well. On straight running work I would prefer three cans out of the six at one time."

D. G. Reid, superintendent at Hogansville, said: "We creel all six at one time and it gives us better results for several reasons. You get all your piecings nearer together and you can watch them better. Another thing: we clean every time they run out and it is the framehand's duty to clean and he can do this when they all run out at a time."

The relative merits of one, two and three processes of drawing were next discussed, and some of the answers read by the chairman to the question of which is best, follows:

"Two processes more even work." "Two, evener work than one and breaking strength not affected." "Two, our numbers are very heavy and one process is not sufficient to draw same." "Two, get more doublings and more even work." "One process gives just as good results as two." "Two processes are good. Three much better on 25s and higher."

The discussion was diverted briefly into a question of speeds. Mr. Long said he runs 365 r.p.m. on the front roller but is arranging to cut that down, by putting in twelve more frames. W. C. Hardy, overseer of carding, Berryton Mills, Berryton, Ga., said he runs two processes of drawing with a front roll speed of 275. Mr. Todd, of LaGrange, said he had different conditions on two sides of his room and ran 358 r.p.m. on one side but was able to run 325 on the other. Mr. Hames gave his speed at 365. Rube Jennings, Jr., said Lanett's speed is 385.

In getting back to the stated question, David Clark, of Charlotte, made this statement:

"At one meeting of the Carding Division of the Southern Textile Association this question was discussed. The statement was made that two processes of drawing gave you evener yarn and one process stronger. Some samples of yarn were brought in, one sample with a pink string and one with blue, and it was passed through the crowd to pick out the more even yarn. Every man in the room but two picked out the one with the blue thread on it as the evener yarn. That yarn was made with only one process of drawing, while the other was made with two.

"I am interested in three mills, making 20s, 24s and 30s, and we wouldn't think of running but one process of drawing.

"I don't think there are many superintendents in North and South Carolina who could hold their jobs running drawing over 300 r.p.m.; 220 is the standard. Where they have room and where they can change the two processes into one process on slower speed, there is no question in the world, if you will make a test, that you will find you get better results at 220 revolutions and with one process. I often hear men make statements about running two processes, but I find very few of them have made the test."

Mr. Howarth called on Mr. Phillips, of Social Circle, as one man who had adopted one process of drawing and asked him to tell about it.

"We have been using one process of drawing for three months, and we get more even yarn, stronger yarn, and better running spinning. We have made a test for 28 days on our warper beams and the variation has been one pound heavy and one light," said Mr. Phillips. "Before we cut out one process we were running 350 r.p.m., and I took the front drawing and put it in line with the other and cut the speed to 204. It increased the breaking strength seven per cent and the running of the work 50 per cent."

Then they started to ask him questions: "Do you attribute that increase in breaking strength to the decrease in the speed of the rolls?" asked Mr. Jernigan.

"The quality of the work is what does it," said Mr. Phillips.

"There is no machine in a cotton mill that does more injury to the staple than the drawing frame," said Mr. Clark at this point. "If you continued to put your sliver through drawing frames three, four, five or six times, you would get it so you couldn't hold it together. You have got the theory that you are getting a great deal more even yarn, but from a practical standpoint you will find you are not getting it, and, if you will do a little investigating on your own account instead of following in the footsteps of your fathers and grandfathers, you will find that you will get just as good results and just as strong yarn."

Mr. Thompson here asked how many processes the Naumkeag Mill, mentioned previously by Mr. Clark, uses, and the reply was that they had the evener drawing with one process in front of it.

Getting back to Mr. Phillips, W. A. Hunt asked if he used the same weight of sliver when he changed from two to one process.

"I used the same weight sliver but took out a tooth of twist on the slubbers, intermediates and fly frames," answered Mr. Phillips.

"What was the draft?" asked John Long. "Six," replied Mr. Phillips. "And the weight of the card sliver?" "63 grains," was the reply.

"I feel sometimes myself that we all—in fact, I know I myself—try to do too much that our fathers and grandfathers did. It has been handed down to me but I am going to try some experiments on one process of drawing," said Mr. Howarth.

"Where is the best place in the card room to make a change in order to maintain even numbers?" was the next

question, and the chairman read some of the answers received:

One man said he changes in the pickers when necessary, but—"Why change?" One man said the intermediates or speeders, another the drawing, another the intermediates, another the draw frame crown gear, another the speeder crown gear, another the drawing, another on front drawing, another in the picker room. "On slubbers and for quick change the back roll on the speeder, if it is a slight change," was another answer. Another said, "We have very little changing to do. When we have to change we do so on the speeders." Another—"Drawing frames, and catch any additional changes on the first intermediates. Very seldom change on fine frames."

Mr. Howarth summed it up by saying that in his position it would be a foregone conclusion that the drawing would be the best place if a man had time, but that he did not have that time and so he makes changes on the roving frames.

Mr. Hames, of Rome, "pleaded guilty" to the reply, asking, "Why change at all; if necessary, do it in the picker room," and said that "if you keep the laps right you will not have to change; if you weigh often enough and go back to the picker room." He added that he never changes at all unless he goes from one number to another. He runs from 7s to 16s.

Mr. Howarth asked regarding changes in weather conditions and the reply was to keep the humidity the same and Mr. Howarth said he would be glad to, only he had "never got so I could tell the Lord when to let it rain."

Mr. Hames said they make duck and are allowed two per cent variation in the cloth, and Mr. Reid, of Hogansville, wanted to know "who in the world you are selling to."

Mr. Reid also explained that between the pickers and the spinning frame there is considerable stock in process, and asked Mr. Hames whether when he caught the necessity for a change at the spinning frame and went back to the pickers to correct it, did he run the stock already past the pickers on through without its receiving the benefit of the change. Mr. Hames said he started it right in the picker room.

"I weigh my drawing at seven o'clock, at 10:30 or 11:00, at one o'clock and at 4:00 or 4:30," said Mr. Chandler, of the Exposition Mills, "and it is mighty seldom that I have to change my drawing, because I fight the picker room and change my drawing only when it needs it. I have not changed the gear on my speeders in eight months. On our regular runs, when the drawing gets off one grain or more, I change, and I change my crown gear; I do not change the draft gear because I do not wait for it to get that far."

"We are on numbers 5½s to 22s," said Mr. Loner, of Alabama City, "and, like all mills, we have had considerable variation. We find by creeling the second process of drawing all at one time, taking a weighing, and making a change if necessary, we eliminate a great deal of changing in the card room and spinning room."

Mr. Long asked Mr. Hames, of Rome, whether he weighs his intermediate laps. Mr. Hames said he did this about once a day.

"I have kept weights for yarn from 10s to 50s, white and colored, and I have tried to keep weights on jacks, first intermediates, second intermediates, slubbers, and drawing frames," said T. R. Lovern, superintendent of the McIntosh Mills, Newnan, Ga., "and I have kept the weights on the finisher drawing for the past ten years—on the crown gear.

"I creel the finisher drawing solid, at one time. For the past three years we have had no trouble with weights."

Mr. Hames asked whether Mr. Lovern had any variation from the top of the cans to the bottom. Sometimes, said Mr. Lovern, but not very often.

As the noon hour was fast approaching, it became necessary at this point to discontinue the discussion on carding. Chairman Howarth read two other questions into the record, the first of which was, "What type of cone belt have you found most satisfactory?"

Among the replies received were the following: "Endless rubber cord"—"Any good type of leather belt with cemented rider one inch wider than belt"—"Cord belts"—"Rubber endless cone belt"—"English endless cone belts, which from my experience have run from eighteen months to two years"—"We use the English cone belt and find it the only satisfactory one we have ever used. Have some that have been running over four years"—"Endless one-inch belt with two-inch rider."

The final question was, "How do you prevent oil, oily waste, and dirty waste from getting into your roving?" It was unfortunate that lack of time prevented discussion of this. Among the answers previously received were:

"Wiping off carriages every doff. Blowing out bobbins with compressed air. Picking out black work in all processes and keeping things clean generally."

"Take extra precaution from the time the cotton leaves the bale."

"That's what we want to know."

"We do not prevent it but keep it down to a certain extent by careful oiling."

"First, keep the steel rolls clean, and free from oil, keep roving boxes cleaned out, keep tops of spindles clean, and keep bobbins cleaned out."

"Use as heavy oil as possible and just enough to serve its purpose."

"Clean flyers every doff and stack roving straight in the boxes when doffing. But can't keep slugs out of our roving."

The morning session was concluded after the reading of this question, and Mr. Howarth expressed his appreciation to the men for their cooperation in the carding discussion. The usual "Dutch" luncheon was next held, with an informal discussion on the reduction of accidents, participated in by Messrs. Thompson, Newsom, Frank Petrea, Heymer, and W. M. McLaurine, secretary of the Cotton Manufacturers' Association of Georgia, who was an honor guest of the occasion. At the completion of the luncheon the discussion was resumed in the

Afternoon Session,

which was devoted to the consideration of spinning questions contained in the questionnaire sent out in advance of the meeting.

At the beginning of the session the meeting went into executive session and elected D. W. Anderson, manager and superintendent, Pacolet Mfg. Co., New Holland, Ga., as a member of the executive committee to succeed W. L. Phillips, whose term expired with this meeting. Mr. An-

derson will serve for two and one-half years.

The spinning discussion was in charge of W. L. Phillips, superintendent of the Social Circle Cotton Mills Company, Social Circle, Ga.

The first question brought up related to filling wind for warp yarns, and was put in this wise: "Does it increase the breaking strength to spin warp yarn on filling wound bobbins with the same twist multiple as used with the warp wind?"

"I think this is one of the biggest questions we have—this relating to filling wind," said Mr. Phillips. "Who will give us the reason it will increase the breaking strength to change from warp to filling wind without changing the twist? I have had some experience with it but I have never found that it would increase the breaking strength where I left the twist the same."

John Hampton, overseer of spinning, Fairfax Mill of the West Point Manufacturing Company, related his experience with filling wind. "I have 20s yarn—18 frames of it—with a two-inch ring, on filling wind. I was making 122 turns on the front roller on the warp wind, and when I went onto filling wind I increased that to 139. My breaking strength increased five per cent, and the slasher and the weaver told me that their work ran much better. I have followed this thing through very closely and it works splendidly, and it works stronger after it is spooled. If you take a paper and twist it around a bobbin and pull that off you will find that you have put in a little twist rather than by pulling it off straight. The work runs just as good and I got an increase of 18 turns on my front roller. I wouldn't put these 18 frames on warp wind again for anything."

"Did you change the twist?" asked Mr. Phillips.

"I took out two teeth of twist," answered Mr. Hampton, "and I still get a better breaking strength than I did before. I increased the spindle speed some but not in proportion as on my front roller because I speeded up my front roller by taking out two teeth of twist. My yarns break better and the spoolers like it much better. My spoolers have 100 spools and in tying up a set we very seldom have three or four ends to break down, where we were continually having trouble before."

"Did you test the strength before taking out twist?" asked Mr. Phillips. "Yes, sir," said Mr. Hampton.

"And was the strength increased before you took out twist?" continued Mr. Phillips.

"Yes, sir," answered the gentleman from Fairfax, "and then after I took out the twist it increased still more."

O. W. Smith, overseer spinning, The Trion (Ga.) Company, wasn't enthusiastic about filling wind. "We have tried it out and I can't see any benefit from it," he said. "We tested 100 bobbins and reeled it off and broke it on the warp wind and then on the filling wind—with the same twist gear—and it was just about the same. It might have been five or six pounds difference, but reeling from the same bobbins off again it showed up right the other way. We tried it by taking out twist and I never did see any gain from it.

"Here a few days ago there was a man from the Whitin shops talking about putting more yarn on the bobbins. We made the test; he reeled the stuff himself, and using a ¼-inch larger ring on the warp wind than on the filling, with the same size ring, it showed up about 300 more yards on the warp wound bobbin."

"I believe myself you get less yarn on the bobbin unless you change the size of the bobbin or ring," said Mr. Phillips.

Mr. Cox, of Anniston, asked if the spooler help could average just as much with the filling wind used on spinning. He said he got good results in spinning and had increased his spooler speed, but that he ran into trouble at the spoolers.

Replying to this, Mr. Hampton said that his spooler spindle speed is 1,015 and the spooler hands are taking care of twelve to fourteen sides where they used to run ten. "I have two spoolers that are keeping up those eighteen spinning frames," he said. "I think your success in spooling depends on the way the overseer and second hand take it and explain it to the help. My help are carried away with it. You will get less yardage on the warpers because it does not get as much tension as on the warp wind and that makes it stronger.

"I hope to have everyone of my frames on filling wind by the time of our next meeting."

"After changing our room over to filling wind we had one more spooler than we needed and we just covered it up and don't use it," said Mr. Phillips. "My results are that I get a greater production because before, on the warp wind, I had to run my spooler guide open to keep up, but now they are set down to practically a number 7 card gauge, and after having cut out one spooler the spooler production is increased 20 per cent."

"Can you not increase the spindle speed on the spoolers?" asked Mr. Heymer. "You have to do it," said Mr. Phillips. "You almost double it." "Our spindle speed is something like 1,000 on filling wind," added Mr. Cox. "On warp wind it was about 600."

"We changed Lanett Mill all over to filling wind some time ago," related Mr. Howarth, "and I ran across some strange experiences. I did not have bobbins enough to start with and put it on the old bobbins, and I put less yarn on them with the filling wind. Then we got in a few new straight bobbins and made them a little longer, but I couldn't get much more yarn on them and they gave me some lot of trouble at the beginning of the set. Then I ordered some cone-shaped bobbins a little smaller in diameter and longer in length, about ⅜ to a half inch longer, and we got about ten per cent more yarn on our bobbins than we did before.

"I cannot say very much about the break. We took out two turns of twist and I cannot see a great deal of difference in the breaking strength. I never thought I got any worse by doing it.

"I had a little trouble at the spoolers. The girls thought they could not make as much money because of more yarn, but I speeded up the spoolers 100 turns per minute and have no trouble at all now. We have gained about eight per cent on speed and about ten per cent more yarn on the bobbin."

"I think the greatest gain in filling wind is the increase in production," asserted Chairman Phillips. "I have never been able to get as much yarn on the same bobbin with the same ring, but the increase in production offsets that."

Mr. Martin, of Griffin, next spoke on this subject. "I am changing over gradually to filling wind," said he, "but

(*Continued on page* 653.)

Machine Calico Printing

BY WILLIAM B. NANSON.

The term "calico printing" is used to signify the production, by various means, of colored patterns or designs upon cotton fabrics, and the term "machine calico printing" refers more especially to that branch of the business by which the colors, or their mordants, are printed upon the cloth continuously by means of engraved copper rollers in connection with a cylinder printing machine.

While machine printing is of a comparatively recent date, the art of printing calico with the alizarine (madder) colors was known to the Egyptians and the countries of the East from time immemorial, and we find on the fabrics wrapped round some of the mummies designs in red and purple, which have been produced by combinations of the color-giving principles of madder with alumina and iron mordants. In Persia and India the art of calico printing had attained a certain degree of perfection, and up to the beginning of the 18th century printed fabrics called "chintz" were imported from those countries.

Calico printing is really a form of dyeing, differing from it only by the fact that the cloth has one or more thickened colors, or their mordants, stamped or printed on it locally, instead of being uniformly colored throughout by immersion in a solution of dyestuff. These printed colors, or mordants, being then further fixed and developed by steaming or "raising" or by dyeing, as the case may require. The close relationship, however, existing between the printing and the dyeing is clearly shown by the fact that, broadly speaking, the whole of the coloring matters employed in the art of printing are identical with those used in the dyeing industry.

Block calico printing, or printing cotton goods by means of carved wooden blocks, was first practiced in Scotland in 1738 and was introduced into England 26 years later where it soon became one of the leading industries of Lancashire. It was found, however, to be suitable only for comparatively coarse designs and so, in 1783, Bell, a Scotchman, invented the cylinder printing machine which is the subject of this series, and which is not only capable of being applied to almost every known style of design, but which revolutionized the industry by making it possible to produce large quantities at a cheap rate and to bring printed calicos within the reach of all, and with the exception of a few improvements to increase the niceties of adjustment and a few additions to enlarge and extend its usefulness the cylinder calico printing machine of today is substantially the same as the one invented by Bell 140 years ago.

But improvements in machine calico printing have not been confined entirely to the mechanical end of its application; in the chemical methods and reactions which are closely allied and in fact inseparable from the mechanical aids to the printer, many old processes were improved and new ones invented, and many new colors were gradually added. Down to the end of the 18th century dyers and printers were almost entirely restricted to the use of vegetable dyestuffs, especially in patterns containing several colors; but with the advance of chemical science all but the best of such colors have been replaced by artificial products.

Among some of the earlier discoveries which have been recorded we may mention the use of the mineral colors in the shape of the oxides, peroxides, suboxides, etc., of iron, antimony, manganese, and lead, which are developed on and in the cotton fiber with which they combine to form colors of great fastness in most cases. These colors are buffs, tans, khaki, Prussian blues, antimony orange, manganese bronze, and the yellow chromates and orange subchromates of lead. Then come the aniline colors of Perkin and Medlock and Griess and then Graebe and Lieberman came with the artificial alizarin.

Within recent years artificial indigo has also been discovered and, where calico printing is concerned, it has already displaced the natural product to a very eminent degree, being especially suited for color mixing purposes on account of its freedom from sand and other extraneous and gritty substances.

And thus, from many sources, the resources of the calico printer are being constantly augmented by the almost unceasing production of new and improved artificial dyestuffs, and the number and variety of these colors within his reach is now so great and their properties so diversified that it is possible for him to produce almost any shade required or called for in styles of work that were formerly restricted to one or two colors only. There are five different methods of printing colored patterns or figures on cotton fabrics:

(1) By hand block printing.
(2) By Perrotine or machine block printing.
(3) By "stencilling."
(4) By flat press printing from an engraved copper plate.
(5) By machine or cylinder printing from engraved copper rollers.

Of these five methods, machine printing is by far the most generally used though hand block printing seems to be again coming into use for the production of certain styles of work more especially in blocking in some styles of cylinder printed fabrics which may be intended for some gaudy fabrics for the eastern trade. However, in this series of articles it is my intention to confine the discussion to the cylinder printing machine and its various products.

As I have already stated, machine printing is the name applied to the process of printing from engraved copper rollers. It is at once the most productive and the most comprehensive of all the various methods of printing, and therefore the most important. By its means almost any style of design on almost any fabric can be rapidly produced in from one to sixteen colors at a single printing.

Under the most favorable conditions as much as 20,000 yards of cloth can be printed in a one-color design or 8,000 to 10,000 yards in a 12-color design, that is, per working day of ten hours. The single color machine fitted for printing one color only is the simplest form of a modern cylinder printing machine; it consists of the following parts, arranged as shown in the two diagrams, Fig. 1 and Fig. 2:

L is a hollow copper roller which has the pattern to be printed engraved upon its surface, this printing roller is carried by a steel shaft or mandril *K*, which revolves in

bearings on the side of the machine. The roller *L* revolves in contact with a cast-iron cylinder or pressure bowl *I* above and with a roller or brush "furnisher" *H* below, which furnisher is partly immersed in the color paste contained in the color box *G* beneath it. A sharp-edged metal

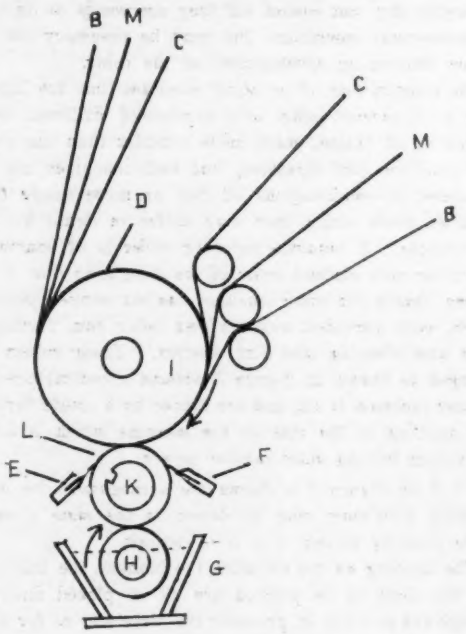


Fig. 1

blade *F*, known as the cleaning doctor, rests upon and behind the engraved roller about midway between its points of contact with the cylinder *I* and the furnisher *H*, this cleaning doctor extends across the full length of the roller and serves to scrape the superfluous color from the smooth parts of the roller, leaving it only in the lines of the engraving.

At the opposite side of the printing roller a second or

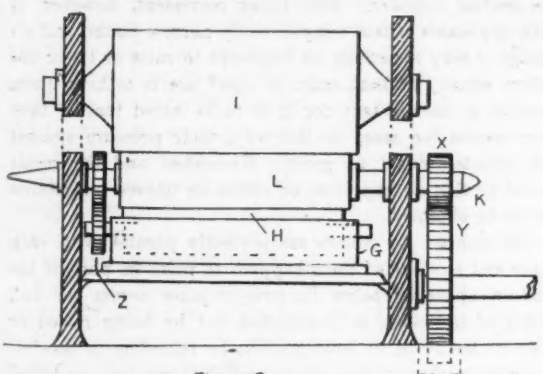
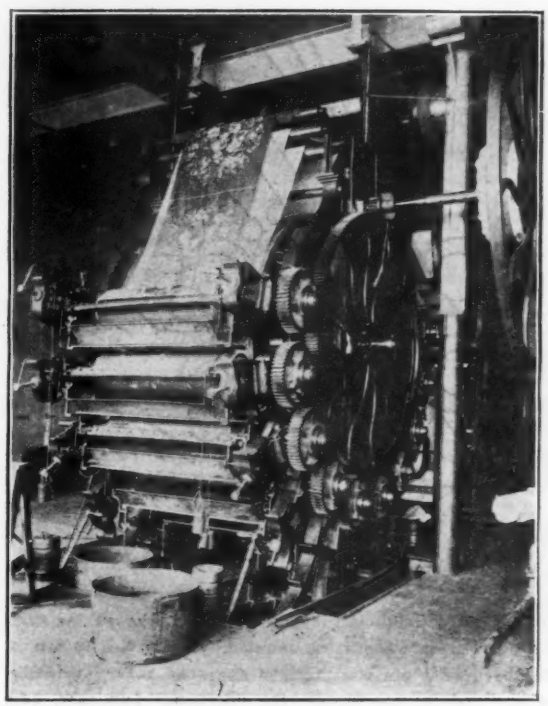


Fig. 2.

"lint" doctor *E* is frequently placed. This is intended to catch the lint and loose filaments which fly off the cloth in its progress and stick upon the moist surface of the printing roller. In the larger multi-color machines where many colors are being printed each from its own particular color box and roller, the "lint" doctor further performs the very useful function of clearing the surface of the roller from the color that it picks up from those parts of the cloth that have already been printed by the other rollers of the pattern. It may be readily understood that if these filaments of cotton and waste color were allowed to go forward into the color box, the color therein would either become unworkable or would be altered in shade, as the case might be. In order to impart to the cylinder *I* the elasticity that is necessary to obtain a full impression of the pattern on the cloth by the printing roll, it is wrapped with several thicknesses of a special fabric woven of linen and wool and known as "lapping cloth" *D;* an endless woolen blanket *C* also circulates round the pressure cylinder; this gives additional "spring" to the surface against which the printing roller works. The back cloth *M* is simply an endless piece or pieces of ordinary cotton cloth and is interposed between the blanket and the cloth to be printed *B*.



A 10-Color Printing Machine

This is to prevent the blanket from becoming soiled by the color paste which will always penetrate more or less through the cloth being printed *B*.

The whole machine is driven by one large gear *Y* in Figure 2 which gears into a small pinion *X*, Fig. 2, on the end of the mandril *K*, Fig. 1. The gear *Y* itself is driven from the main power or by separate motor and must be so arranged that variable speeds may be obtained.

On the other end of the mandril another pinion is fixed gearing into a similar one Z on the bearing of the "furnisher" roller, and which, therefore, runs in the opposite direction to the printing roller. When a brush furnisher, however, is used it is frequently made to work in the same direction as the printing roller by means of a small spur gear or carrier interposed between the two pinions as shown at *N*, Fig. 3.

The pressure cylinder *I* is not directly coupled to the drive of the machine, but is turned by the revolving print-

ing roller *L*, that is, by the friction caused by its pressure upon the printing roller. This pressure, in a single color machine such as we are discussing, is derived from a system of weighted compound levers which bear upon the ends of the cylinder which is mounted in adjustable bearings, carried in heavy slotted heads and capable of being raised or lowered, independently of the levers, by means of screws. By this means dead weight pressure is avoided and some allowance is made for any unequal conditions which might occur when different thicknesses of cloth are printed at the same time or when a seam at a piece end passes through the machine.

In some makes of single color printing machines the foregoing arrangement is reversed and in place of the cylinder being pressed against the printing roller, the printing roller is pressed against the cylinder by means of screws

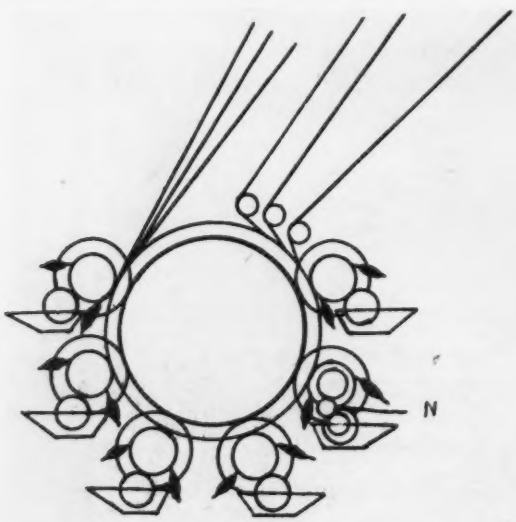


Fig. 3.

and weighted compound levers, which act through the sliding bearings in which it is mounted. Where this system is employed it is obvious that the engraved roller (printing roller) and its accessories—the "doctors," furnisher, and color box—must all move together. To accomplish this the said accessories are carried on a plate attached to each of the roller bearings and consequently moving with them.

In actual operation the machine works as follows: The printing roller *L* revolves in the direction of the arrow, Fig. 1, and during its revolution it receives a full charge of the printing paste from the color box *G* by means of the furnishing roll *H;* the excess is then scraped off its surface by the cleaning doctor *F* and the color that remains in the lines of the engraved pattern is then printed on the face of the cloth *B*, which, in company with the blanket *C* and the back grey *M*, travels continuously through the printing machine between the cylinder *I* and the printing roller *L*, and receives the impression of the pattern and absorbs the color paste from the engraved lines of the roller. Continuing its revolution the roller passes under the "lint doctor" *E*, which clears it of lint and loose threads before it enters the color box to receive a fresh charge of color to enable it to complete another round of operations, and so on indefinitely the same cycle of operations is carried on and repeated again and again for a whole day's work, or less, as the case may be.

After the goods are printed they pass directly over steam heated drying cans, or, in some print works, through a hot air drying apparatus. When the printed goods are thoroughly dry and cooled off they are ready to undergo any subsequent operations that may be necessary for the further fixation or development of the color.

The construction of printing machines that are intended to print several colors or a number of different colors at once is, of course, much more complex than the single color machine just described, but such machines may be considered as combinations of two or more single color machines, from which they may differ in detail but not in principle. A separate printing roller is of course required for each distinct color in the design, so that it will be seen that a six color machine has six copper printing rollers, each provided with its own color box, furnishing roller and clearing and lint doctors. These rollers are arranged as shown in Figure 3 around a central pressure cylinder common to all, and are driven by a single "crown" gear working at the side of the machine which is driven in its turn by the main motive power.

At *N* in Figure 3 is shown the arrangement by which the back furnishers may be driven in the same direction as the printing rollers, if it is so desired.

The lapping on the cylinder, the blanket, the back grey and the cloth to be printed are all so placed and pass through the machine in precisely the same way as for single color printing.

In a multicolor pattern each roller is engraved with only that portion of the design which is required to be of one particular color; and in order to enable the printer to fit these separate colors in the design in exactly their proper places on the cloth (and to keep them in place when once they are fitted) each printing roller runs in a combined spring and lever bearing, which allow of its being moved while the machine is in motion, either laterally or up and down at either end in a direction tangential to the central cylinder. This latter movement, however, is only applicable within comparatively narrow limits, and although it may sometimes be employed to raise or lower the rollers equally at both ends, its chief use is to keep them parallel to each other; for it is to be noted that if they were moved too much in this way, their pressure against the cylinder would be greatly diminished and the result would be that an imperfect or rather an uneven impression would be obtained.

If, then all the rollers are perfectly parallel with each other and any one of them happens to print its part of the pattern above or below its proper place across the full width of the cloth, it is adjusted, not by being raised or lowered bodily in its bearings, but by retarding or accelerating, momentarily, the speed at which it revolves, an effect which is equivalent to raising or lowering the roller but without the disadvantage of altering its position and consequently its pressure against the cylinder. This necessary rotary adjustment is accomplished by means of ingeniously constructed differential pinions, known as box wheels, one of which is fixed on the mandril of each roller, and which not only serves to gear it with the main driving wheel (crown wheel) of the machine, but at the same time permits

of its speed being regulated, as before stated, independently of the driving wheel, and without interfering in any way with the speed of the other printing rollers.

When in actual use the "box wheel," after being pushed on the mandril as far as it will go, is firmly secured to it by driving a cotter through the slots of its sleeve and a corresponding cotter hole in the mandril itself. When the printing roller is screwed up into contact with the cylinder the teeth of the "box wheel" gear mesh into those of the "crown wheel," that is, the driving gear. When thus in gear the box wheel *as a whole* can only revolve when the crown wheel is revolving; but by means of a screw its *inner disc*, and consequently the printing roller and mandril, to which this inner disc is directly keyed, may be turned around quite independently of either its *outer shell* or of the driving wheel of the machine (crown wheel). The effect of turning this screw is to cause it to press against one or the other of two lugs, between which it is confined, and in so doing to move around the inner disc by forcing its connecting piece toward the opposite lug. For instance, if while the machine is running and the printing rollers are revolving in a given direction, the screw is turned toward the circumference of the box wheel, it is evident that the corresponding roller will be turned in a direction contrary to its revolution, and that its speed will be reduced thereby, and that in consequence its position in relation to the other rollers will be altered, and that its printed impression will appear lower down on the cloth as it emerges from the machine in front of the printer. If turned in the opposite direction, the speed of the roller will be momentarily increased, and its impression is raised higher up accordingly.

The increase or decrease of the speed of the roller only lasts during the time that the actual turning movement of the screw is in progress; after that, it immediately returns to its original speed, but its altered position is permanent, or at least as permanent as the slight unavoidable irregularities in the working of the machine will allow. In this way the impression as made on the cloth by any printing roller of a multicolor pattern, may be raised or lowered about two inches, while the machine is either stationary or in motion and without affecting in any degree the relative positions of the other impressions toward each other. When the ordinary type of box wheel, which I have described, is employed, it will be seen that the rollers must be placed in the machine within approximately two inches, or less, of their correct positions; but later improvements render this precaution unnecessary, as the most recent type of box wheels allow of their inner discs being turned completely around while their outer shells are still in gear with the driving gear or "crown wheel" of the machine.

The facilities for horizontal, vertical, and rotary adjustments afforded by the bearings and the box wheels give the machine printer complete control over the movements of his printing rollers and enable him to fit together the various component parts of even the most intricate designs with an ease and accuracy impossible by any other process of printing.

Aside from the extra attention demanded by the increase in the number of the printing rollers and their accessories, a multicolor printing machine is worked in all respects precisely similar to that of a single color machine. The fabric to be printed is entered from the back in just the same way, and in passing between the printing rollers and the cylinder, receives from each roller in turn a colored impression of that part of the design engraved upon it, so that as it leaves the machine it is found to be fully printed with as many colors as there are rollers.

The mere fitting of the rollers in their exact places is of course but one part of a printer's duty; in addition he has to see that his color boxes are kept full of clean color paste; also that the back greys and cloth to be printed are kept smooth and free from creases and that the threads of the printed cloth are kept straight and that the doctors are properly filled and rightly adjusted and that the lapping, blanket, and drying arrangements are all in the best of working condition.

The speed at which the printing rollers are driven is of some importance and must be taken into consideration, as the faster they revolve the lighter will be the shades, because they will deposit less color upon the fabric. Again, if the pressure upon the rollers is too great, the color is not fixed upon the fabrics, and produces, on dyeing, unequal shades; if, on the other hand, the pressure be too light, the same defect is produced, but from a different cause, as in the latter case, the color merely touches the fabric, and does not penetrate, but remains on the surface and ultimately rubs off.

Cylinder machine printing is subject also to another very serious defect unless the printer is careful, and that is the production of unequal shades, arising from the action of the pressure cylinder upon the engraved printing roller being imperfectly uniform; and this defect, which may be somewhat lessened by increasing the pressure, appears on the contrary in all its force when the pressure is too light.

Hence we see the importance of uniform pressure in order to obtain a uniformity of shade. This defect in printing may be ascertained by examining both selvages of the fabric, which ought to be precisely similar; if one is of a deeper shade than the other, the pressure is not uniform.

Again, if the heavy iron cylinder is not of equal thickness and evenly balanced the colors will lack uniformity. It is therefore essential for good work that the cylinder be *bored* out to an equal thickness before *shrinking* in the center shaft and it should then be accurately balanced in the machine before printing with it.

Again, the pressure of the cylinder has quite a bearing upon the activities of the color paste as the defects arising from the color depend upon its thickness and upon the pressure and speed with which it is applied. If the color is too thick it cannot enter into the lines of the engraving and the speed must be slow and the pressure heavy; if, on the other hand, it is too thin, it will run and spoil the design and the speed and pressure and drying action must be increased, a medium thickness, pressure, etc., suitable to local conditions, which long experience alone can teach, and which varies not only with each kind of fabric (the color being thinner and the pressure lighter as the texture is finer), but with each kind of design; for the more the design is covered, i. e., heavy, the thinner the color must be; for this reason, designs printed on a colored ground can only be well done with gum colors, as those thickened with starch cannot, without being decomposed, be diluted beyond a certain limit and are therefore not adapted for this class of work.

(This is the first article of a series on this subject by Mr. Nanson. The next article will appear in an early issue.—The Editor.)

Towels and Towelings

BY T. WOODHOUSE AND A. BRAND.

None of the previous examples in this section have had any part of the texture developed by special colored threads; it is now proposed, however, to introduce two or three examples of such fabrics, in each of which distinctively-colored warp yarns play a more or less pronounced part.

In the first of these examples, a reproduction of which appears in Fig. 42, colored threads are used to form an effective, though comparatively narrow, border stripe, some-

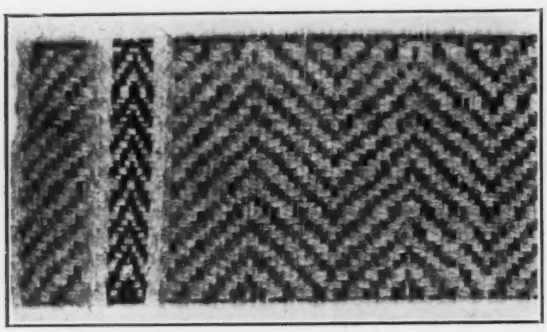


FIG. 42.

what similar to some of the kinds already discussed, e.g., those in Figs. 9, 10, etc. The stripe contains 21 threads of 2-fold colored cotton, arranged in the following order:

Light Blue 2		2 =	4	
White 3	3	=	6	21 threads in all
Scarlet	11	=	11	

There are 24 threads per inch in the body of the fabric, and 24 picks per inch. The stripe, as usual, is crammed, and the 21 threads of which it is composed occupy only half

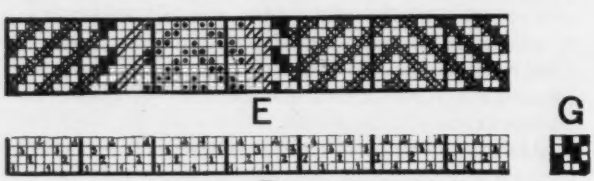


FIG. 43.

an inch of the width; a similar distance separates the outer edge of the stripe from the selvage threads.

In a 27-inch fabric, the arrangement of the complete warp would be as follows:

Heavy Cotton Twist for Selvage....4			4 =	8
Side Border..... 10		10	=	20
Colored Stripe...	21	21	=	42
Body of Fabric..		624	=	624
				694 threads in all.

The fabric is a typical example of a cheap twilled stripe union crash toweling, made from unbleached flax tow warp and natural-colored jute filling. The design is based on the 2 up 2 down common or serge twill, as will be seen in Fig. 43, where the point paper design E shows two repeats in the way of the filling of the first 55 threads from the left-hand selvage of the cloth.

In the point paper design E, Fig. 43, the warp threads for the major part, i.e., the body of the cloth, are represented by crosses, the blue cotton threads are indicated by the solid black squares, the white cotton by the diagonals, and the scarlet cotton by the solid black circles. If the weaving plan G is used, in which oppositely interweaving threads are on consecutive harnesses, the section E of the point paper design would necessitate the use of the draft F in the same figure.

It will be seen that the body of the fabric may be regarded as being composed of alternate stripes of right-hand and left-hand twills, the whole uniting to form a characteristic example of an arrow-head, pointed, feather, or herringbone twill across the width of the fabric.

In the fabric illustrated in Fig. 44, the component stripes are separated from each other—and are thereby accentuated

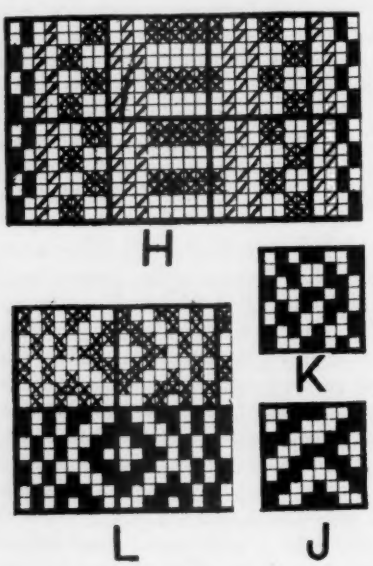


FIG. 45.

and clearly defined—by using a single scarlet thread between each pair of different weave effects forming adjoining stripes. The fabric shown is a typical example of a flax tow fancy crash in which use is made of a pretty elaborately colored border stripe. The warp is unbleached single yarn, fairly well twisted, while the filling is a heavier count of bleached yarn. There are 21 threads per inch in the body of the fabric and about 25 picks per inch of filling in the finished state.

The warp threads of the fabric are arranged in the following order:

6 threads white cotton twist for selvage.
13 threads flax tow warp forming a right-hand twill.
28 threads 2-fold cotton for the colored border stripe.
9 threads flax tow warp forming a left-hand twill.
1 thread scarlet cotton to define the limit of the stripes.
17 threads flax tow warp forming a combined rib and diamond stripe.
1 thread scarlet cotton to define the limit of the stripes.

25 threads flax tow warp, forming a waved twill stripe (left, right and left) composed of 8, 9 and 8 threads respectively.

The 17-thread and 25-thread stripes form the body of the fabric, and are repeated across the width, finishing with a 17-thread stripe. Thereafter, the order is the exact reverse of that indicated above, and the fabric terminates with 6 threads of white twist cotton at the opposite selvage.

The last example which will be dealt with in this particular section is reproduced in Fig. 46, which illustrates a small portion of a union crash toweling made with flax tow warp and jute weft. A bold border stripe effect is obtained by using an irregular basket weave on 10 threads and 8 picks developed by 3-fold scarlet cotton yarn. There are 21 threads per inch in the body of the fabric, while the filling is inserted at the rate of 24 picks per inch. The stripe is one inch wide, and its outside edge is situated one inch from the selvage; it contains 25 threads arranged in five groups of five threads each.

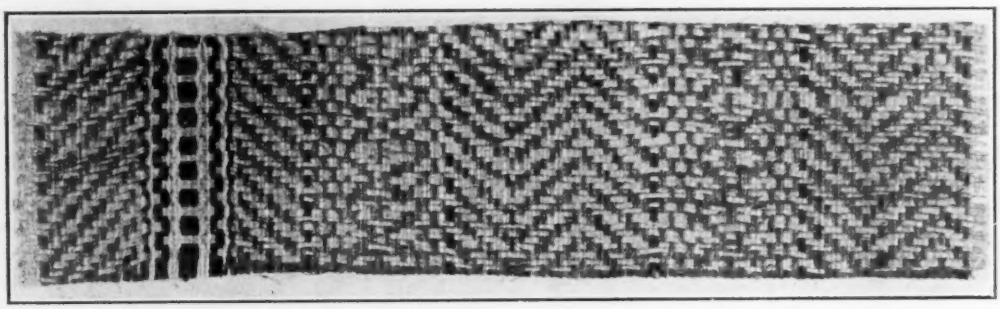


Fig. 44.

The basis of the design is the 2 up 2 down common twill, with the necessary alterations in weaving plan and draft to permit the formation of a diamond effect as well as the simple right-hand and left-hand twills. Two of the threads of the base weave are used to develop the colored stripe, and the same two methods of interweaving are employed to form a simple rib or repp ground on each side of the diamond pattern.

The colored stripe is a variant of the so-called chain border class; its 28 threads all interweave 2 up 2 down in irregular basket or hopsack order, while the color arrangement is as follows:

Blue	2			2	= 4
White	2	3	3	2	= 10
Scarlet	4	6	4		= 14

28 threads

Four repeats in the way of the filling of the weave of the colored stripe only are shown at H, Fig. 45, where the solid black squares indicate blue threads, the crosses show scarlet threads, and the diagonal marks represent white threads.

The twilled stripes on each side of the colored section are in ordinary 2 up 2 down order, to left and to right respectively. The 25-thread stripe in the body of the fabric is also in the same well-known twill, which need not be further discussed at this stage.

Two repeats in the way of the filling of the diamond weave stripe are shown at L in Fig. 45, where it will be seen that a simple 8-thread, 8-pick diamond weave is bordered by a number of threads working in 2 up 2 down warp rib or repp order. The method of joining up the warp rib to the diamond may not appear very effective, but it is often difficult to make perfect joinings.

The diamond pattern necessitates 8 picks for one repeat, and although the 2 up 2 down twill parts could be woven with 4 harnesses, in this case they would probably be spread over 8 harnesses. Alternative weaving plans are given at J and K, Fig. 45. The latter is to be preferred since it places pairs of cutting threads on consecutive pairs of harnesses, and permits the use of 4 plain top rollers if desired.

One complete unit of the stripe weave is shown at M, Fig. 47, where all the 25 threads are given. Four complete units of the ground weave appear at N in the same figure; one unit is in solid black squares, and the other three units or repeats are indicated by crosses. The ground weave is

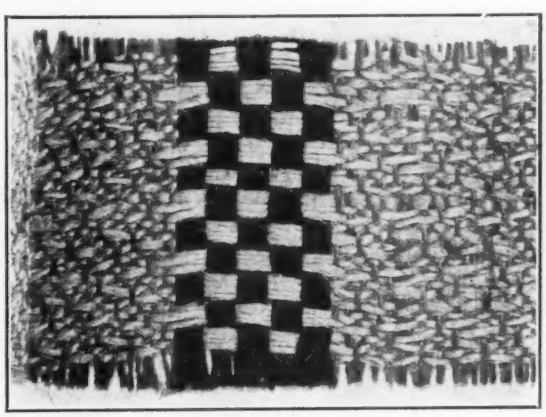


Fig. 46.

complete on 8 threads and 8 picks, and is capable of being woven on 5 harnesses, using the weaving plan shown at P and the corresponding draft Q. The weave, however, is perhaps more generally woven with 8 harnesses and with a straight draft. The harnesses required for the border stripe are quite distinct from those required for the body of the fabric, and so, for the complete fabric, either 7 or 10 harnesses would be necessary in all, depending upon which of the two methods of drafting indicated is adopted.

The weave adopted for the ground fabric in this instance gives rather a good crape effect, and is widely employed in all classes of cloths where such an effect is desired. It is often known as the "oatmeal" weave, and, although it may be regarded as a standard weave for toweling fabrics it was

(*Continued on page* 596.)

What the Southern Mills are Doing

A meeting of interest to southern mill men was that held in Charlotte, N. C., on March 4th of cotton yarn spinners, at which the Southern Consolidated Yarn Spinners' Association was reorganized, the name changed to the Southern Yarn Spinners' Association, and definite action taken toward the forming of an effective influential organization of these mills. B. B. Gossett, president and treasurer of the Riverside Mfg. Company, Anderson, S. C., and of the Chadwick-Hoskins Company, of Charlotte, N. C., was elected president.

A board of directors was selected, consisting of the following: B. B. Gossett, Charlotte; Robert Chapman, Cheraw, S. C.; W. B. Moore, York, S. C.; J. A. Long, Roxboro, N. C.; Clifford J. Swift, Columbus, Ga.; C. E. Hutchinson, Mount Holly, N. C.; J. E. Erwin, Morgantown, N. C.; R. C. McEachern, St. Paul's, N. C.; A. M. Dixon, Gastonia, N. C.; A. M. Fairley, Laurinburg, N. C.; M. L. Cannon, Concord, N. C.; K. S. Tanner, Rutherfordton, N. C.; J. E. Parker, McColl, S. C., and Scott Roberts, Anniston, Ala.

In addition to effecting a reorganization of the association, much discussion was conducted concerning market conditions and practices, and the association recorded itself as disapproving speculation in yarn sales and a committee is to be appointed to work on rules that will provide for each transaction being a bona fide sale, and members were urged to sell their product through legitimate reliable houses only.

The headquarters of the association will be moved to Charlotte and a full-time secretary employed, it was decided at the meeting, and other steps were taken for the strengthening of the organization.

* * * *

Along with a very perceptible drop in business activity in the yarn and goods markets it was but natural that during the past month construction activity in southern textile circles should not exhibit the pace engendered by better business and prospects. There were, however, a number of enlargements reported throughout the section.

As to business, it was apparent that the slackening of orders affected the mills very strongly, but contrary to some reports this was not so generally reflected in drastic curtailment. As a rule the mills made every effort to keep going so long as it seemed wise in the individual case on the particular product. Isolated cases of drastic curtailment and possibly complete shutdown were reported but these were by far the exception and by no means the rule.

As to construction news, the Proximity Manufacturing Company at Greensboro, N. C., announced plans to rebuild their power plant, adding new boiler equipment, stokers and coal handling equipment. They have purchased from the General Electric Company a 1000-k. w. extraction type turbo generator, and condenser from the C. H. Wheeler Company. They will install piping for steam usage in the dye plant.

The White Oak Mills of the Proximity Manufacturing Company will individualize part of the spinning now driven by group motors, and 48 7½-horsepower Allis-Chalmers Manufacturing Company motors have been purchased for this purpose. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

The Statesville (N. C.) Cotton Mills are planning the early completion of an addition which will make the equipment of the plant include 16,000 spindles, it is reported.

China Grove Cotton Mills, China Grove, N. C., have placed a contract with the Parks-Cramer Company, of Charlotte, N. C., to equip the combing and carding departments in the basement of the mill building with humidifying apparatus.

The contract for the electrical work of the Art Cloth Mills building, at Lowell, N. C., including wiring, motors, etc., has been let to Michael & Bivens, of Gastonia. J. E. Sirrine & Company are the engineers on this work.

The Gambrill & Melville Mills Co. Bessemer City, N. C., has installed 100 additional looms in its plant, which has undergone a general overhauling during the past few months.

Thomas Nelson, director of the North Carolina Textile School, which is a department of the N. C. State College, Raleigh, N. C., has announced that his department has received from the Goulds Manufacturing Company, Seneca Falls, N. Y., a 4 x 6 Triplex pump. This pump has been donated to the textile school and will be used in connection with the Parks-Cramer system of humidification in the carding and spinning room. The New England Butt Company, Providence, R. I., have donated a braider for use in the textile school, Professor Nelson states.

The addition to the Lancaster Cotton Mills, Lancaster, S. C., on which contract was recently awarded to Potter & Shackleford, Greenville, S. C., will be of mill construction, two stories and basement, 160 x 108 feet. Plans call for the installation of slasher equipment, 320 looms and cloth room machinery. J. E. Sirrine & Company are the engineers.

Considerable improvements will be made at the Franklin Process Spinning Mills, at Fingerville, S. C. (formerly the Cohannet Mills). These will include general improvements to the machinery and buildings and village homes, replacement of present spinning with Saco-Lowell spinning frames, overhauling card room machinery and the installation of new drawing frames, as well as the installation of 36 Universal winders and a new lighting system.

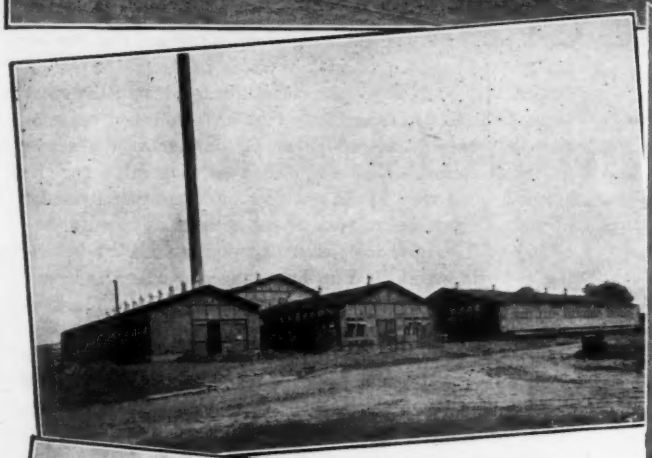
The Alice Manufacturing Co., Easley, S. C., has let contract to the Parks-Cramer Company for additional equipment for their humidifier system.

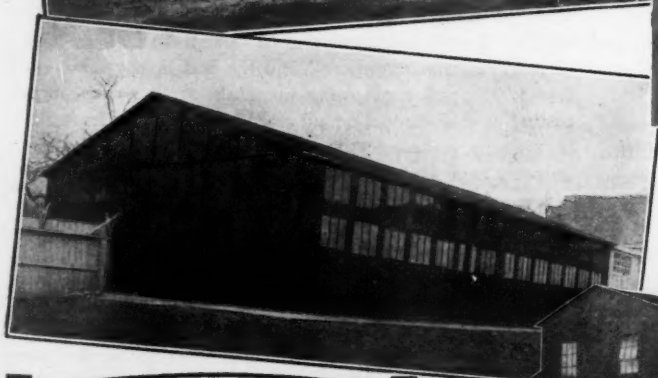
Contract for some 325 houses has been let to the Minter Homes Company of Greenville, S. C., by Col. Leroy Springs for location in the villages of several of his mills. These will be located as follows: 50 in the village of the Eureka Cotton Mills, at Chester S. C.; 200 at the Lancaster Cotton Mills, and 75 at the Fort Mill (S. C.) Manufacturing Company.

W. K. Stringer, of Anderson, S. C., has purchased the Keowee Yarn Mill, at Walhalla, S. C., and plans to put the mill into operation following certain necessary preliminary work. Mr. Stringer will assume personal charge of operations.

The Newnan Cotton Mills, Newnan, Ga., are reported making alterations in the No. 1 Mill preparatory to install-

TRUSCON
COPPER STEEL STANDARD BUILDINGS





Simplified Building for the Textile Industry

American industries are demanding one-story instead of multiple-story buildings because they save in routing, conveying and handling. New plants in the textile industry are showing this same building tendency.

Truscon Copper Steel Standard Buildings meet all one-story needs and many two-story requirements. You have a complete choice of sizes, types and arrangements. Each building is individually designed to meet the exact needs of the owner. Because of the use of standardized units, manufactured in quantities, you are assured of the utmost value for your building dollar. These fireproof quality buildings cost less than other permanent constructions.

Write for Full Information.

No matter what you are planning to build, get our estimates and suggestions. Useful building catalog sent free on request. Use coupon or write us a letter.

TRUSCON STEEL CO.
YOUNGSTOWN, OHIO

Buildings illustrated are:
1—California Shade Cloth Co., San Francisco, Calif.
2—Southland Cotton Co., Memphis, Tenn.
3—The Felters Co. Millbury, Mass.
4—Gautschky Silk Dyeing Co., Paterson, N. J.

TRUSCON STEEL COMPANY, YOUNGSTOWN OHIO ··· U.S.A.

Warehouses and Offices from Pacific to Atlantic. For addresses see 'phone books of principal cities. Canada: Walkerville, Ont. Export Div: New York.

Send useful building book and suggestions on building to be used for.....

Length..... Width..... Height.....

Name.....

Address..... Cot. 4-24

ing 20 new cards and 16 spinning frames. Other improvements and additions are also planned.

The Georgia Duck & Cordage Mill, Scottdale, Ga., has awarded contract for six new 60-inch looms. They recently completed an installation of eight narrow looms and four sewing machines, now in operation producing laundry nets.

Tallassee Mills, Tallassee, Ala., are having plans drawn by J. E. Sirrine & Company, engineers, Greenville, S. C., for a 30,000 spindle weaving mill. Plans call for a four-story reinforced concrete main mill building, 367 x 144 feet, opener building 80 x 100 feet, warehouse, and mill village with 175 houses. The product of the new mill will be light duck and heavy sheetings, the same as the existing plant. The machinery will be motor driven.

The Georgia branch of the United States Finishing Company, located at Cedartown, Georgia, which commenced operations in January, is now handling work in a regular manner. The plant is specializing in sulphur dyes and is equipped for both black and olive drab shades. As a result of its location in the South the transportation of goods East is eliminated which is quite an item in handling the work originating from southern gray mills. This Georgia plant is under the management of Paul A. Merriam, as resident manager, who has a staff of trained men transferred from the New England branches of the company to work with him.

Lanett Mill, West Point Manufacturing Co., West Point, Ga., will build a new cloth room 296 x 80 feet, one story and basement, of brick construction. The present cloth room machinery in the mill will be moved to the new building. J. E. Sirrine & Co. Greenville, S. C., are the engineers.

Cotton Mill Products Co., Natchez, Miss., are erecting a one-story brick building in which washers, starch mangles and tenter frames will be installed as additional equipment for the mill.

Tupelo Cotton Mills Tupelo, Miss., are erecting a 30-foot brick addition which will be used as a cloth inspection room.

Postex Cotton Mills, Post, Texas, are installing 36 additional wide automatic Stafford looms. The product is wide sheetings, sheets and pillow cases.

A note of romance was sounded in the textile world when it was announced early in March that the Marble Fallas Textile Mills Company had been granted permission under the Texas Blue Sky Law to sell its capital stock for the purpose of financing a new cotton textile mill on a site recently purchased at Marble Falls, Burnet County, Texas. The stone building which will house the plant was erected 30 years ago by Gen. A. R. Johnston, a Confederate veteran, who acquired all of the land around Marble Falls in return for his services in the war. Owing to the financial panic during Cleveland's second administration, just as the building was completed, the mill never was equipped with machinery.

The building is two stories, 100 x 300 feet. About sixteen and a half acres of land is included, together with right to continuous use of the waters of the Colorado River for power. A recent appraisal of the property, made by M. H. Merrill & Company, of Boston, shows that the natural fall of the Colorado River at this point, where a drop of 23 feet takes place, will be sufficient to develop necessary power. The entire holdings have an appraised value of $304,000.

Immediate rehabilitation of the property and starting the erection of a dam calculated to give a minimum of 1,000 horsepower were plans announced. A mill of 15,000 spindles will be installed, to be operated by electric power generated from the falls.

The directorate of the company is composed of Robert E. Witt, Dallas; T. A. Cheeves, George H. Carter, J. H. Batson, Marlin; G. L. Jones, Marble Falls, and William G. Broadfoot, Atlanta Ga.

The New England Mill Situation.

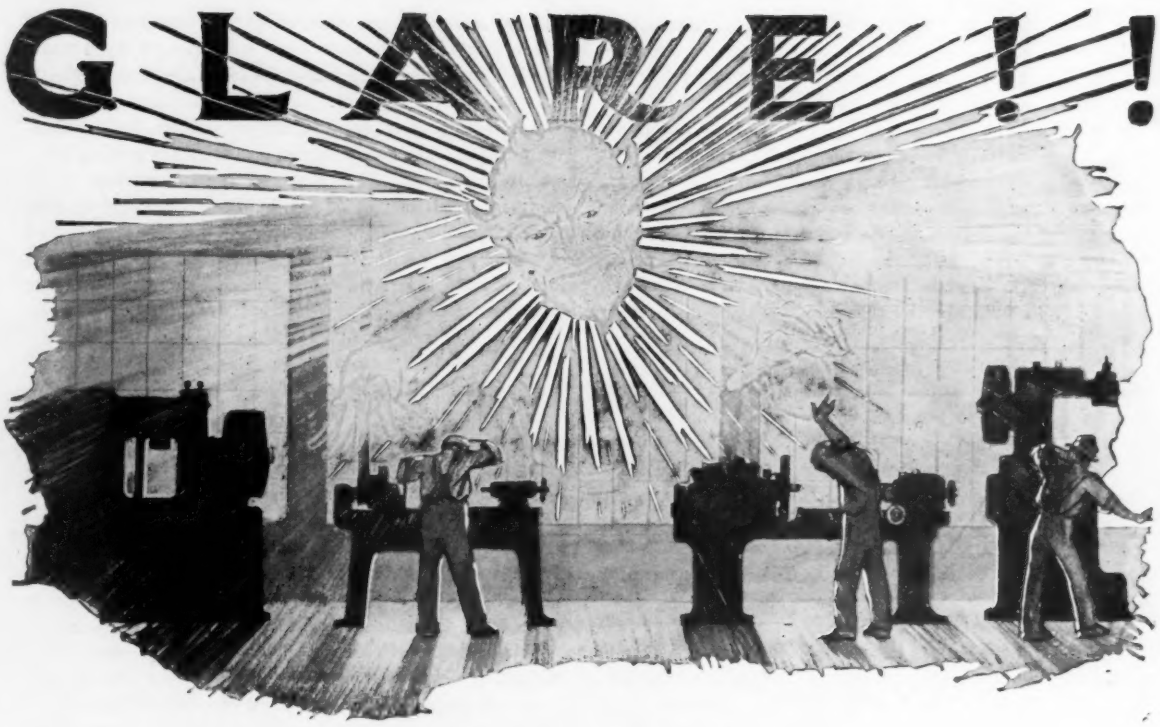
It is the belief of a number of New England cotton manufacturers that the crisis in the industry this year has been the result of selfishness and bad management on the part of manufacturers themselves. Reserves that should have been used for the maintenance of properties in years of general dull business are being frittered away in a vain endeavor to meet a condition that could have been best met by a general curtailment of production beginning as far back as last November.

They believe that if the leading manufacturers of the North and South had come together and agreed that the industry was confronted with what is in essence a cotton famine they could have taken measures to prevent the great losses to mills and merchants that have followed speculation that has not helped either the farmer or the dealer in actual cotton. Had manufacturers cooperated for the common good they would not now be witnessing the sales of staple goods below cost prices without any benefit accruing to the actual consumer. The losses mills are suffering are being swallowed up by retailers or other traders.

It is the contention of these New England manufacturers that regulated curtailment would long since have stemmed the price decline that has been going on since the turn of the year and would have brought about more equitable conditions for the producer of cotton as well as the producer of cloth. The selfishness alluded to refers to the policies of some manufacturers to "run their mills as long as mills are run anywhere," and the bad management refers to the policy of piling up stocks made from cotton costing over 25 cents a pound and perhaps more. In itself, that policy is bad for the mill, but it is worse for the industry as a whole. The conditions that demanded united effort to meet them are just as dangerous for the mills as many others that have been met and controlled in the past through cooperative effort.

The accumulation of stock goods in mill hands has been shown for a month past by the inability of selling agents to maintain prices when sales have been increasing. More business was done in print cloths and sheetings in the four weeks ending March 15 than in the preceding four weeks, nevertheless, prices constantly sagged, and oftentimes went down when cotton itself was steady for a few days. Before there can be any real recovery in prices to a level that will give mills an opportunity to show profit a volume of accumulated stocks will probably have to be sold at a loss to the producer.

Many New England mills that have curtailed reduction persistently have lost some money but their managers are able to show that they have not lost anything like the sums



Eliminate It—

But Let in 94 per cent of the Light

at Fraction of Cost of Shades

THOUSANDS of industrial plants now enjoy 94% of maximum daylight illumination and yet eliminate glare.

They simply coat the glass with Skyco No-Glare.

This splendid product diffuses the sun's rays and eliminates the red, or glare, rays. Glare is eliminated. And with less than 6% loss in illumination intensity. Actual light measuring tests show that with glare eliminated thru Skyco No-Glare the illumination intensity is over 94% normal.

Easy to Apply

Skyco No-Glare is a bluish fluid of semi-transparent properties when applied. You simply spray or brush it on the glass. Immediately it forms an effective barrier against glare. Rain or weather conditions cannot affect it. Yet you can remove it easily with warm water and a brush.

Amazingly Economical

Skyco No-Glare costs but a fraction of the price of shades. A single gallon covers from 300 to 400 square feet of glass. The price is only $3.50 per gallon [less in quantities]. It is guaranteed by the makers of the famous *Skybryte Liquid and Powder Cleaners.*

Accept This Trial Offer

We want you to know from your own actual experience how effectively and economically you can banish glare with Skyco No-Glare. Order one gallon at $3.50 F.O.B. Cleveland. Use as much as you wish. If you are not well pleased return the balance at our expense and we will cancel invoice.

SKYCO NoGlare

The SKYBRYTE *Company*
11th Floor - Keith Building - Cleveland, Ohio
Chicago Branch: 20 East Jackson Boulevard

they would have lost had they gone on operating, and piling up merchandise for which there was no ready market on a profitable basis. Had New England mills not curtailed, it is now very plain that the losses in the industry would have been enormous. Perhaps they are much larger than are likely to be shown in this single year. Had these losses come about through a wide dissemination of desirable merchandise among consumers some permanent good might have come to the industry as a whole. As matters stand, the retailers have merely continued a policy of buying from hand to mouth, and they have only been able to do so profitably because goods have been in overplentiful supply.

There is much less pessimism in New England about the future of the cotton industry than there was three months ago. There are still many mills idle, and there is actual suffering reported among operatives in some of the larger centers where idleness has been prolonged. But mill owners and mill managers are more determined than they were to try out new financial and manufacturing methods in order to take advantage of some merchandising possibilities in the trade which have not been fully tested out.

One of the lines of cotton cloth production in which the New England centers have not given way to the South is that of wide sheeting, sheet, and pillow case production. The Naumkeag Mill at Salem, Mass., makers of the Pequot sheets and pillow cases, and the Pepperell Mills of Maine, are among the prosperous mills of New England and their earnings over a period of years compare well with those of any long established mill in the South making similar goods. That the business is still in good shape, and is so regarded by investors, may be seen by two recent incidents. The Naumkeag Company has been adding materially to its producing facilities. This month the Pepperell Co. has brought out the Laconia brand of wide sheeting in bleached and brown, in a much finer count than the standard Pepperell goods. Prices on wide sheetings were reduced 5 cents a yard on 10-4 goods, from 70 cents to 65 cents, and the new business coming forward is satisfactory.

New England fine goods mills have been feeling the effects of the very large importations of English goods, Southern mills making fine combed goods have also found it hard to sell their products at a profit, for much the same reason. The importations in 1923 were three times as large as the importations of any pre-war year. The cloths brought in were of a character to displace many of the more staple goods made in fine mills here. The fine pongees, lawns and shirtings have been displaced to a large extent by the fine combed yarn poplins, called broadcloths by English manufacturers, and by the fine high count shadow striped sateens brought in for lingerie. Recently, some fine colored yarn blue oxfords have been coming forward and they are taking the place of many of the staple striped fine madras hitherto used from domestic mills. The English mills, favored by cheap Egyptian long staple cotton of selected grades used almost exclusively by English mills, have been able to do better than American mills using the very high priced and scarce long staple American cotton.

The prosperous run on ginghams was undoubtedly hurt a great deal by the importations a year or two ago, especially those low grade fine yarn ginghams imported by converters from English mills that used poorly dyed yarn and this gave the gingham style idea a serious setback with users of all ginghams. American mills that would not make more of their opportunity to furnish fine combed yarn ginghams are now doing so and they are getting business readily. The New England mills that have gone deeply into the project of styling their ginghams so that they look to be something more than alternate blocks of color are also getting gingham business. The southern gingham mills that have taken the cue are also reporting more progress than the mills that are standing idle on styles and new colorings.

The gingham business in New England is by no means good. It is much better than it was and is probably now maintaining a 70 per cent capacity output. With fall lines opened and on the market, the small day to day sales are bringing forward enough business to prevent accumulations. The mills are not making money. Their managers say they are losing less by running than they would if they were stopped, which is another way of saying that occupation orders without profit are the rule.

One of the remarkable developments that has come to full market light in the past month is the large use of artificial silk in bedspreads. The Bates mills started this production a year or two ago. Now there are silk and cotton goods coming from nearly all the bedspread mills of New England. Some of the new designs in jacquard figures and flowers are the most ornate weaves ever turned out by these factories. Some goods are being made in the piece to be used as tapestries. The crinkled spread, with its alternating stripes of brilliantly dyed art silk, marks a wide departure from the satin and crochet bedspreads of recent seasons. And the business is said to be in its infancy.

There has been no improvement in the Fall River situation. Barely 50 per cent of the spindles installed are active. The large print works in Lawrence and Fall River are running half time and half capacity. The percale trade is very quiet and fancy prints for draperies and wash fabrics make up most of the work being done. The job finishers are only about 60 per cent occupied. Some of the bleacheries are running barely four days a week. Fine goods mills in New Bedford have been curtailing more generally since the first of March and are now running to about 75 per cent capacity. A substantial part of the output is in art silk or cocoon silk and cotton mixtures. The plain, fine combed yarn fabric business is stagnant.

The yarn trade continues poor. It is stated that stocks of sale yarns in fine numbers are not large but the limited production is constantly pressed for sale to meet the competition of southern mills. Owing to the continued effects of a change in the tire fabric industry there is still a great deal of idleness in some of the yarn mills that were built to supply a need that seemed unfillable only four years ago.

One of the significant features in the industry recently has been the unanimity with which local boards of assessors have had their assessments of mill properties lessened by court action. In one or two instances a mark down of 20 per cent has been foreshadowed at Fall River, and it is believed that a similar markdown will be ordered at Manchester, N. H., where the Amoskeag Company protest-

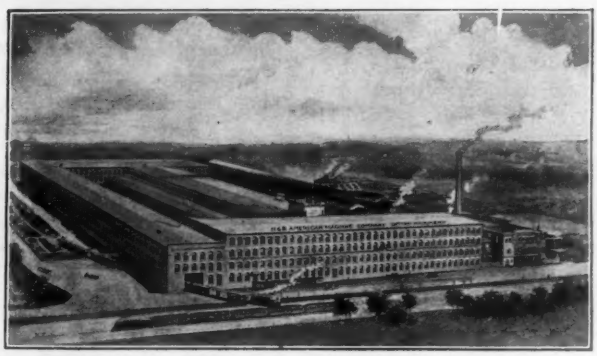
H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

—BUILDERS OF—

COTTON PREPARATORY & SPINNING MACHINERY

FEEDERS
OPENERS
BREAKER
INTERMEDIATE
and FINISHER
LAPPERS



REVOLVING FLAT
CARDS
DRAWING FRAMES
SLUBBING
INTERMEDIATE
ROVING FRAMES

SPINNING FRAMES and TWISTERS
(Band or Tape Driven)

RINGS—FLUTED ROLLS SPINDLES—FLYERS

Southern Offices: 814-816 Atlanta Trust Co. Bldg., Atlanta, Ga.

ed tax valuations. One of the really great handicaps in New England is the mounting municipal taxation and it seems now as if a stop has been put to the reckless advances that have been going on in cities where the chief tax paying properties are mills that must meet competition in a general market.

It is reported that some attempts have been made in small centers to bring about wage reductions but as a rule manufacturers do not think anything can be done in that direction this year.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, March 15th, 1924.

Since our last review of one month ago the market declined further to the extent of about 2½ cents, due to the continuance of unfavorable domestic textile trade conditions and the want of a better demand for spots. Recently the market recovered somewhat because of the continuance of unfavorable weather conditions in the interior interfering with farm work in preparing for the next crop.

Compared with last year the South marketed during the past week 99,000 bales vs. 114,000, making the total thus far this season 9,734,000 against 9,656,000 to even date last season.

Europe continues to take freely of cotton from America, exports the past week amounting to 81,000 bales vs. 99,000 one year ago, since August 1st—or since opening of the season —4,377,000 against 3,715,000, and prospects are that shipments abroad will remain liberal.

On the other hand, takings by American spinners thus far this season are much less than to even date last season, as will be noted by the following table, although they were larger than last year the past week, 234,000 vs. 206,000, and it is possible that they may pick up in the future.

Spinners Takings of American Cotton Since August 1:

	This Season	Last Season
North and Canada	1,405,000	2,016,000
South	3,112,000	3,397,000
Foreign	3,650,000	3,761,000
World	8,167,000	9,174,000

The big falling off in takings by American spinners compared with last season, especially by northern spinners, and the poor demand for cotton goods, was the principal reason for the drastic decline in the market since the close of November when market was at its "peak."

Distribution of the World's Visible Supply of American.

Stock At—	This Year	Last Year
Liverpool	455,000	448,000
Manchester	95,000	49,000
Continental ports	327,000	318,000
Afloat from U. S.	271,000	290,000
U. S. ports	685,000	674,000
Interior stocks, 30 towns	572,000	614,000
World's visible of American	2,405,000	2,393,000

EXPORTS FROM U. S. FROM AUGUST 1ST TO CLOSE OF FEBRUARY.

To—	This Year	Last Year
United Kingdom	1,437,116	1,155,367
France	557,370	514,354
Italy	408,812	368,182
Germany	887,510	629,835
Other Europe	490,477	512,131
Japan	439,384	398,302
All other countries	129,512	160,974
Total for 7 months	4,350,181	3,739,145

CENSUS REPORT.

United States—	This Season	Last Season
Consumption, Feb., lint	507,876	566,805
Consumption, Feb., linters	41,698	47,296
Consumption, Feb., inc., linters	549,574	614,101
Consumption, 7 months, lint	3,595,436	3,839,780
Consumption, 7 months, linters	325,653	389,052
Consum't'n, 7 months, inc., linters	3,921,089	4,228,832
Mill stocks close of Feb.	1,578,272	2,020,900
Stocks in public stg., Feb.	2,485,009	2,803,304
Total stocks close of Feb.	4,063,281	4,824,204
Active spindles during Feb.	32,683,786	35,304,423

The demand is fairly good abroad, but as yet shows no signs of reviving in America, but stocks are light on this side of the Atlantic, which would make for a strong market in event of buying improving.

New crop preparations have received a further setback the past week by unprecedented cold weather for this time of the year and by general rains over the southern portion of the belt, rain, sleet and snow over the northern portion. Unless better weather is had during the last half of March to permit completion of plowing, the new crop is likely to get off to a late start.

Generous winter rains have been obtained, however, and the low temperatures will probably exterminate much insect life, and if good weather is had for a sufficient period, much of the delay in preparing for the next crop would likely be overcome.

A more general recognition of the relation of business in our national life has brought about recently a greater interest in the place occupied by business administration in education similar to that of the recognized professions. A very interesting booklet dealing with "Business, A Profession," and which treats on this thought, has just been distributed by the Graduate School of Business Administration of Harvard University, Cambridge, Mass.

Analyses of standard American coals, showing their respective heat values, is an important feature of a booklet, "The Steam Coal Buyer and Salesman," recently issued and procurable from National Coal Mining News, Charleston, W. Va. Losses of railroad transportation, tables of the cost of ash and moisture in coal, and other information makes this booklet a very helpful one to the man in charge of the power end of a mill using coal.

Pontacyl Fast Black BBO is a new acid color of bluish black shade developed by E. I. du Pont de Nemours & Co. It is especially recommended for shading silk in silk-cotton hosiery.

Towels and Toweling.

(*Continued from page* 589.)

extensively adopted, some years ago, in the manufacture of jute cloth which, after suitable stiffening treatment, was made up into summer hats for ladies.

The unit of the weave may be considered as consisting of four alternate threads of the 8-harness twill, 3 up 3 down, 1 up 1 down, arranged in 4-thread broken twill order on the odd-numbered threads of an 8 x 8 block of point paper, while the even-numbered threads are all alike and work plain. Another method of construction is illustrated in its various stages at R, S, T and U, Fig. 47. The first stage in the construction of the design is shown at R, where single marks are made, in 4-thread broken twill order, on the alter-

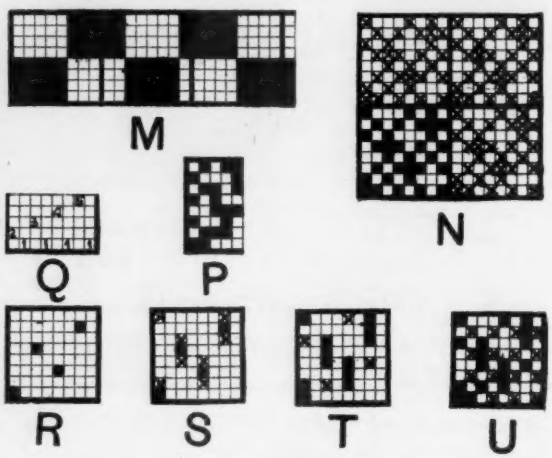


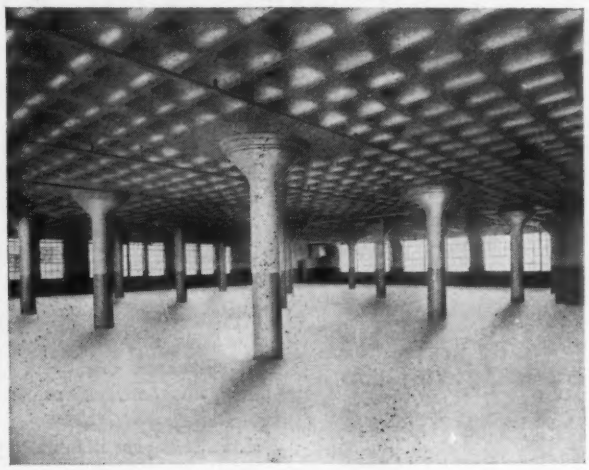
FIG. 47.

nate threads of the 8 x 8 block. The second step, shown at S, consists in adding two marks to each of those shown at R, one mark above and one below the existing mark on each of the four threads; these added marks are indicated by crosses in the incomplete plan S. The third step is to add another mark on the second pick below each warp float of 3, see T, Fig. 47, while the last step is to fill in, on the even-numbered threads, the interlacing effect of one thread of the plain weave; these marks are in crosses in the complete plan U, Fig. 47.

(*To be continued.*)

An Improved Shaft Hanger.

The Dodge Manufacturing Corporation announce an improved pressed steel hanger. The frame is of box construction welded *and riveted* together. A malleable iron foot of ample proportions provides a broad, solid bearing and extends downward a considerable distance on the frame which contributes a great deal to the rigidity of the hanger. The improved bearing supplied with this hanger provides for either ring or capillary oilers. Rings may be removed and capillary blocks substituted, or vice versa, if desired. The hanger is finished with a special paint containing varnish and embodies all of the features of lightness, strength, ease of erection and unbreakable qualities that have made the pressed steel hanger a popular type with millwrights.



A mill white that retains its cheerful brightness

It is remarkable the way Wahcolite will lighten the interior of a factory. This wonderful mill white diffuses light to every corner.

Wahcolite drys hard and smooth. A wall coated with Wahcolite is less affected by dust and dirt than any other finish and stays white longer. And Wahcolite is easy to clean.

Many large manufacturers find Wahcolite to be most economical. Time cannot turn it yellow. It will not chip, crack or peel.

Send today for complete information about this master finish. Write for your free copy of our booklet No. 19, "Keeping in the Spotlight."

On the Outside

Bay State Brick and Cement Coating is the ideal outside finish for walls of stucco or cement. It creeps into the pores of the walls and seals them absolutely moisture-proof.

WADSWORTH, HOWLAND & CO., INC.
BOSTON
Brooklyn Jacksonville

WAHCOLITE
A Bay State product

BAY STATE PAINTS VARNISHES

Notes About Men You Know.

M. R. Macomson, superintendent of the Saxon Mills, Spartanburg, S. C., will, it is reported, assume charge of the Cash Mills at Blacksburg, S. C., as president. The name of the mill will be changed and operations started as soon as the necessary machinery can be purchased. J. W. Brown, of Spartanburg, was originally president of the Cash Mills, but later resigned and was succeeded by A. W. Love, of King's Creek. The Cash Manufasturing Company was organized by the late E. R. Cash and a building erected at Blacksburg some time ago. Before the machinery could be purchased, however, Mr. Cash died and as he was the active operating executive in charge, the affairs of the company were brought to a standstill.

D. C. Jones has become superintendent of the Judson Mills, Greenville, S. C., succeeding J. T. Tidwell, resigned.

T. J. McNeely has resigned as superintendent of the Rex and Priscilla Mills at Gastonia, N. C., and has accepted a position with the Alta Vista Mill, Alta Vista, Virginia.

John H. Rutledge was made general manager of the Vance Cotton Mills, Salisbury, N. C., succeeding the late Walter M. Crump. Mr. Rutledge has for some years been secretary-treasurer of the China Grove Cotton Mills at China Grove, N. C.

J. C. Seagle has become vice-president of the Caldwell Cotton Mills, at Lenoir, N. C., which were recently acquired by the interests of J. L. Nelson and associates.

Howard F. Almy has been appointed assistant sales manager of the following mills: Gray Manufacturing Co., Parkdale Mills, Inc., Flint Mfg. Co., Arlington Cotton Mills, Arrow Mills, Inc., Myrtle Mills, Inc., and Arkray Mills, Inc. Mr. Almy's long experience in the fine cotton yarn industry will prove valuable to him in his new connection with this organization selling the products of this group of mills, of which J. H. Separk is secretary and treasurer, and J. L. Gray is vice-president and general manager of manufacturing. Mr. Almy will make his permanent headquarters with the general sales manager, H. A. Florsheim, 225 Fifth Avenue, New York City.

W. W. Greer has resigned as overseer of weaving at the Ware Shoals Mfg. Company, Ware Shoals, S. C., and has become associated with the Seydel Chemical Company as traveling representative in North and South Carolina. Mr. Greer is a member of the Board of Governors of the Southern Textile Association.

P. B. Heywood has become associated with S. B. Alexander, of Alexander & Garsed, Charlotte, southern agents for Crompton & Knowles Loom Works, and will assume many of the business duties of E. T. Garsed, who retired recently after many years association with Mr. Alexander. Mr. Heywood has been purchasing agent for the Crompton & Knowles Loom Works at the factory in Worcester, Mass.

James Lanier has been promoted to overseer of spinning at the Shawmut Mill, West Point Mfg. Co., Shawmut Ala.

J. R. Corley has resigned as assistant superintendent at the Aragon Mills, Aragon, Ga.

C. E. Reese, gas and electrical engineer, has been appointed general manager of the Bluefield Gas & Power Co., Bluefield, W. Va. Mr. Reese has been connected with the Westinghouse Electric & Mfg. Co. as section head of the stoker sales and publicity departments, Philadelphia.

Eugene Herring has become superintendent of the McLin Textile Corporation, Rome, Ga., succeeding O. W. Whatley.

C. H. Lockman has become overseer of weaving at the Union-Buffalo Mills, Union, S. C., it is reported.

James Platt has become superintendent of the Acworth Cotton Mills, Acworth, Ga.

A. B. Edwards has been promoted from overseer of spinning to superintendent at the Calhoun Yarn Mills, Calhoun, Ga.

H. F. Jones has been made president of the Echota Cotton Mills, Calhoun, Ga., succeeding J. A. Strain, who has purchased the Echota Mill No. 2 in Rome, Ga., and will operate it as the Strain Mfg. Company. Mr. Jones will continue in his former position as treasurer, and A. H. Chastain will remain secretary, of the Echota Cotton Mills.

C. A. Vander Pyl, secretary and treasurer, Mossberg Pressed Steel Corporation, Attleboro, Mass,. has taken over the handling of sales and advertising for that company, succeeding A. A. Underwood.

Oscar D. Grimes, who recently became general manager of the Athens Manufacturing Company, at Athens, Ga., has been superintendent of the Milstead Manufacturing Company, at Milstead, Ga., for a number of years. Mr. Grimes is one of the leading operating executives of the South, and is at this time chairman of the board of governors of the Southern Textile Association.

A. B. Cobb has become overseer of spinning at the Phenix Mills, Kings Mountain, N. C., succeeding E. W. Morris, resigned.

Charles L. Upchurch has resigned as superintendent of the Whitehall Yarn Mills, Whitehall, Ga., being succeeded by J. B. Williams.

W. A. Wyatt has become cloth room overseer at the Caraleigh Mills Company, Raleigh, N. C. This position was formerly held by T. C. Readling.

W. H. McGlown recently became overseer of weaving at the Adams Cotton Mills, Macon, Ga.

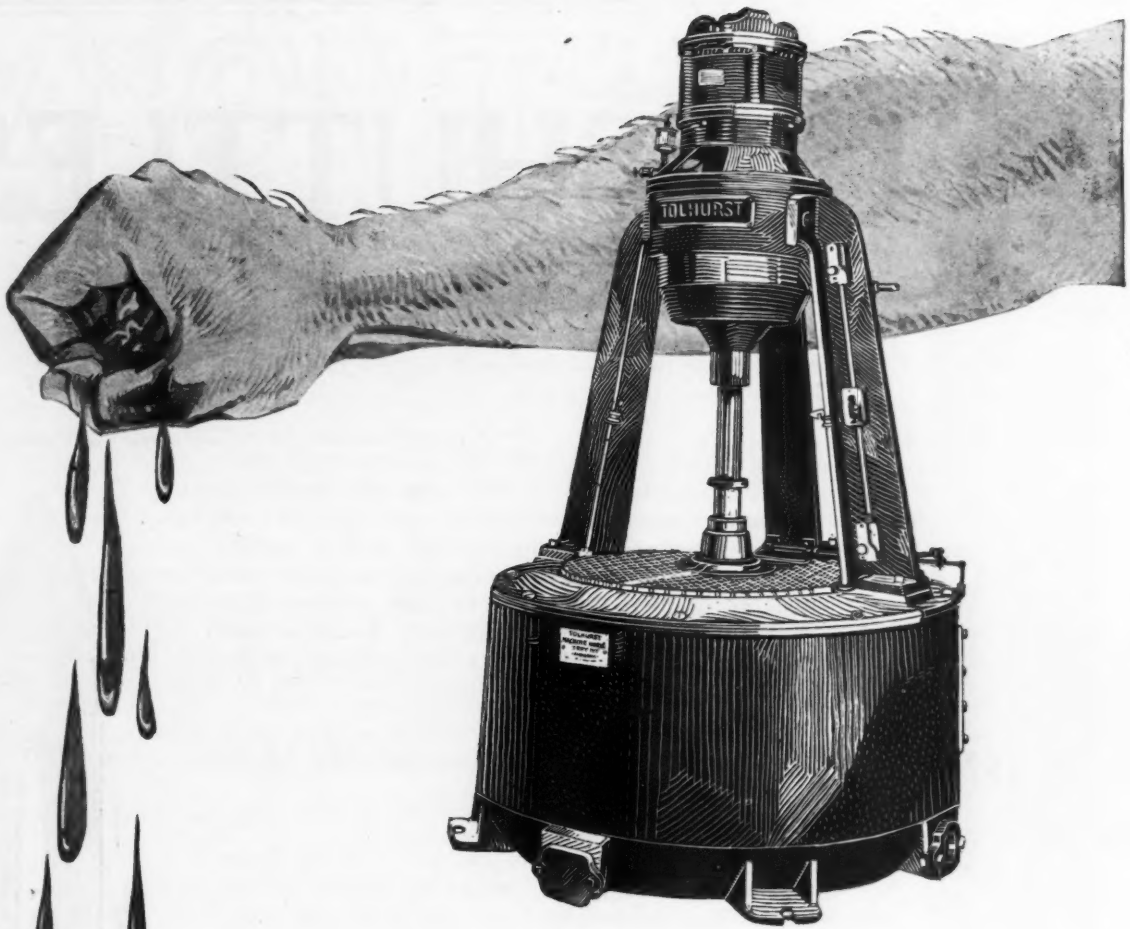
J. W. Brown has become overseer of spinning and twisting, Mill No. 1, Clover Mills Co., Clover, S. C. He was formerly superintendent of the Jonesboro Cotton Yarn Mills, Jonesboro, Tenn.

J. T. Honeycutt, formerly overseer of carding and spinning at the Oakboro Cotton Mills Co., Oakboro, N. C., has become overseer of spinning and twisting, Mill No. 2, Clover Mills Co., Clover, S. C.

A. H. Whitney has been promoted to overseer of carding at Mills No. 1 and No. 2, Clover Mills Company, Clover, S. C.

A. D. Bolt has become overseer of weaving at the Mills Mill, Greenville, S. C.

N. L. Whitten will be overseer of weaving at the Stark Mills, Hogansville, Ga. He recently resigned a similar position with the Thomaston Cotton Mills, Thomaston, Ga.



The GYRATING SPINDLE

A Tolhurst feature for better Extractor operation

The Gyrating Spindle eliminates vibration and all its attendant damage, and assures longer service with lower upkeep cost.

Write for folder describing Tolhursts —made in all types and sizes.

TOLHURST
REG. U.S. PAT. OFF.
CENTRIFUGAL
EXTRACTORS

T.M.W.

TOLHURST MACHINE WORKS, Troy, N. Y.

ESTABLISHED 1852

New York Office: 111 Broadway

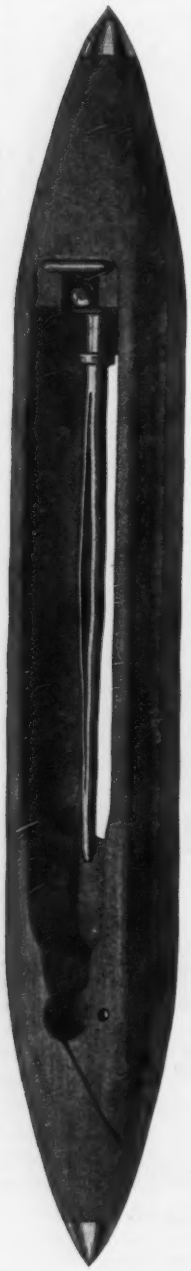
Western Representative:
John S. Gage
8 So. Dearborn St.
Chicago, Ill.

Southern Representative:
Fred H. White
Realty Bldg.
Charlotte, N. C.

San Francisco Representative:
B. M. Pilhashy,
Merchants Exchange Bldg.
San Francisco, Cal.

Canadian Representative:
W. J. Westaway Co.
Westaway Bldg., Hamilton, Ont.
400 McGill Bldg., Montreal, P. Q.

"You will find TOLHURSTS at Booths 125 and 162, Knitting Arts Exhibition."



U S SHUTTLES

The "Stetson" Hand-Threading Shuttle is the best exponent of the hand threading type of shuttle that has ever been put on a loom.

The "S Eye Automatic Shuttle" is another U S product that has convinced the most skeptical it is the best shuttle ever made for automatic looms. Several loom builders have approved the "S-EYE" as they, as well as the numbers of users, realize that simplicity and ease in positive threading, uniform tension, freedom from unthreading, misthreads, mispicks and broken picks are good reasons why a weaver of first quality can afford to use no other.

We make a specialty of rolls, especially for the Universal and Foster Winders.

With wider experience, more expert workmen, greater resources and a vast buying power, you can readily understand why U S products are recognized as standard throughout the textile world and why this superior quality can be sold at a lower price.

A trial order is all that is necessary to convince you of U S superiority.

U S B & S CO. PRODUCTS

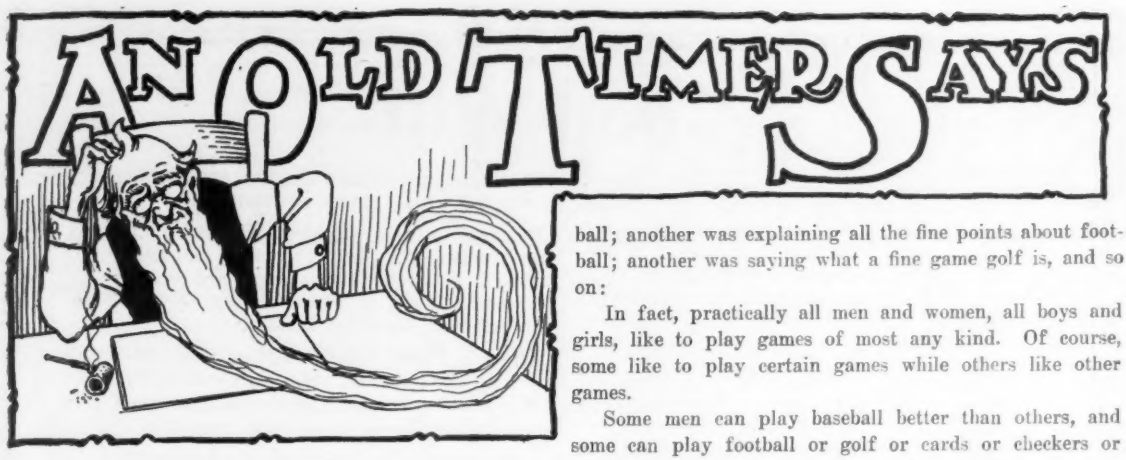
BEAMS	SPOOLS	SPEEDERS	ROLLS
Cotton	Moquette	WARP	Comber
Rubber	Drawing	FILLING	Underclearer
BOBBINS	Warper	CAP SPINNING	Drawing
SHUTTLES	Twister	FLAX SPINNING	Winder
SKEWERS	Jack	TWISTERS	ETC.
	Silk	TRIPTODS	
	Belting	QUILLS	

U S BOBBIN & SHUTTLE Co.

Eight Factories

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

Providence R.I.



Sy-kol-o-gy! By George, I believe I have learned how to "say it," even if I don't know how to spell it.

You know, when I try to spell it, it always gets mixed up with physiology or some other -ology—but never mind about the spelling of these big words if we "Old Timers" can just find out what they mean.

I don't mean the dictionary meaning, but plain, honest-to-goodness common sense. You know I hear so many of these fine speaking and young college men talking about psychology and psychological facts, and using other big words, that I often wonder whether they really know the practical meaning of them or not.

I have found that there is often a very wide gap between "theory" and "practice," and I have also seen some very fine examples of "theory" that needed a great big chunk of common sense to go with it.

Guess most every overseer or superintendent has seen one of those fellows who could take out a slide rule and tell you how to set up a card or a loom to get the theoretical results—but swap that fellow's slide rule for a set of card gauges or a handful of wrenches and tell him to *show* you —and that is another tale.

Now please do not misunderstand "Old Timer" as discrediting the fellow with a college education. Far from it—those who know me personally can vouch for that—but I do say that some of the men who have been fortunate enough to get the college education need a good large lump of common sense to mix with it.

This type of man is found to a much larger extent among those who have been placed in executive position without ever having been a practical overseer, than the textile graduate who goes into the mill and works his way up to overseer or superintendent.

To be sure that I make myself understood, let me repeat that theory *and* practical experience make a very strong combination and when you can add two more big words—common sense—you can keep your eye on the man who has all of these under his hat.

There is no reason why any practical man cannot get the theory—if he will *study*—nor is there any reason why the theoretical man cannot get the practical experience—if he will *work*. As for the common sense—well, I'll tell you what I think about that some other time.

I heard a bunch of men talking the other day about "sports." One man was telling how much he enjoyed baseball; another was explaining all the fine points about football; another was saying what a fine game golf is, and so on:

In fact, practically all men and women, all boys and girls, like to play games of most any kind. Of course, some like to play certain games while others like other games.

Some men can play baseball better than others, and some can play football or golf or cards or checkers or marbles or pitch horseshoes better than others.

But I wonder just why we all like to play some kind of game? Don't you suppose it is mainly due to the fact that there is friendly rivalry in all games—rivalry, or the desire to outclass your competitor?

"Old-Timer" has got a hunch that rivalry, competition, the desire to excel, is at the bottom of the real pleasure of most all games.

And what gives us this pleasure? Could a man have much fun playing a game of marbles away off in the desert of Sahara by himself? Well, not hardly! He's got to have an audience—a grandstand full of people—an opera house full of people—a gallery to see him make that long drive in golf.

If there is no one to see us "beat the other fellow," we don't get much pleasure out of it.

You'll have to admit it, brother; we are all very vain—we like the applause.

I have been told that even a race horse will make better time on the track when the crowd of people is there and the track is full of horses, than he will on his trials alone.

Seems like we have just about "biled" this thing down to the fact that for a man to excel in anything he must enjoy it—it must be a pleasure—he must have an audience.

Now here is what I have been preparing you for? Why in common sense can't we carry this same reasoning to our work?

I claim that an overseer or superintendent has the greatest opportunity of a man in any line of work to make play out of his work—to make his work a pleasure.

Why, goodness, man! Your help is your audience, and they are ready to applaud in a thousand different ways when you show by your management that you can "beat the other fellow."

An overseer can work up friendly competition among his weavers, frame hands, spinners or section men, and they will all enjoy it.

Suppose you see how many cuts two of your 20-loom weavers have got off for the last four or five weeks—then drop around to John's looms and tell him that he got off two more cuts last week than Sam did, but Sam got off them more than he did the week before, and ask John how many he is going to get off this week, and whether he thinks he can beat Sam next week.

Then in a day or two have about the same conversation

(*Continued on page* 609.)

Good-Will

All business has a *Soul* as well as a *body*. The body is factory or store, organization and goods. The *Soul* is the stamp on the public mind. When that stamp is impressed by the desire to serve, by faith in the merit of the product, by courtesy, square dealing and sincerity, the reaction is Good-Will.

The potency of Good-Will is measured by its *earning power*. Earning power is the reflection of Service. When Service merits compensation *beyond* the current rate of interest on tangible assets it becomes Good-Will.

Good-Will is the personality of business. So long as Faith and Service are maintained it *must* grow; it cannot die.

Personality is a great asset. Represented on the Balance Sheet or not, it can and should be periodically appraised on a scientific basis, its contributing factors determined, its value known.

There is a well defined method of establishing the material value of Good-Will. It is based on *certain* facts and figures—carefully defined—accurately estimated.

In the reorganization or sale of a business, or in computing Inheritance Tax, the necessity of determining the material value of Good-Will is especially apparent.

ERNST & ERNST

AUDITS—SYSTEMS—TAX SERVICE

NEW YORK	RICHMOND	DETROIT	PITTSBURGH	ST. LOUIS	NEW ORLEANS
BUFFALO	CLEVELAND	CANTON	CHICAGO	KANSAS CITY	LOUISVILLE
ROCHESTER	CINCINNATI	DAYTON	MILWAUKEE	OMAHA	DALLAS
BOSTON	TOLEDO	GRAND RAPIDS	MINNEAPOLIS	DENVER	HOUSTON
PROVIDENCE	COLUMBUS	KALAMAZOO	ST. PAUL	ATLANTA	FORT WORTH
PHILADELPHIA	YOUNGSTOWN	WHEELING	DAVENPORT	SAN FRANCISCO	SAN ANTONIO
BALTIMORE	AKRON	ERIE	INDIANAPOLIS	LOS ANGELES	WACO

FEDERAL TAX OFFICE: 910 TO 918 MUNSEY BLDG., WASHINGTON, D. C.

NOMARKOFF

REG. U. S. PAT. OFF.

RUBBER COVERED ROLLS

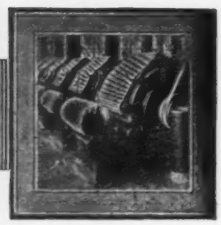
FOR BLEACHERIES
DYE WORKS AND
GINGHAM MILLS

STOWE & WOODWARD CO. NEWTON UPPER FALLS, MASSACHUSETTS

The Rubber Roll Makers

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



How is Dust Room Capacity Figured?

Editor Cotton:

I should like to see discussed in "How Other Men Manage" how many square feet a dust chamber or cellar under a picker room should be per fan, the fans revolving 800 and 1,500 r.p.m.?

Would also like to hear from some of the mill men as to how they go about finding out if their dust cellar is large enough when installing new or additional machinery in the picker room and not making any change or enlargement in the dust chamber?

Another question is, how, if the air chamber is too small for the number of fans blowing into same, is it noticeable in machine or laps of the department?

I hope "Wash" and others will give us something worth while on these questions. M. B. R. (N. Y.)

The Loom Trouble Rectified.

Editor Cotton:

I appreciate the replies of "Tarheel" and "Jack (Texas)," in the February number, to my question on loom drives. They are both fine.

As to "Tarheel's" suggestion, we were not able to use it as our arrangement was not so as to make it convenient.

Now as to the dope of "Jack (Texas)," this is all good stuff, and judging from his letter, "he knows his loom."

However, I think he is mistaken in his opinion as to the speed as Draper's recommended speed for a 40-inch E model is 165 picks and we have always run ours at 160. But his suggestion about the head gears being worn on the pick and causing too much lost motion, is what hits me just right. In accordance with his suggestion we are changing the head gears and find we are getting a good smooth running loom. Our gears are worn badly not only on the pick but all the way around and by renewing the crown or top gear and putting in new cam shaft boxes, we are solving our problem.

As to "Jack's" other settings they are our recognized standard and are, I think, the standard of all mills using Draper looms. F. C. J. (S. C.)

To Degum Ramie or China Grass.

Editor Cotton:

I am desirous of securing the best method to degum ramie or China grass. At present we are soaking in soft soap and then boiling for seven hours. The result is far from satisfactory, and any information your correspondents could give would be appreciated.

G. F. R. (China)

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

"The Man Who Knows Why."

Editor Cotton:

The discussion which has been going on in the pages of Cotton about the college man in industry has been interesting. This question is timely and is assuming more importance every day. There is no better manner for both sides—that is, the college-educated and the self-educated man—to understand each other than to read the various contributions to Cotton relative to this subject. When one man thoroughly understands another man the bitterness which sometimes exists between men vanishes in this enlightenment.

I have heard executives of two different cotton manufacturing corporations state that it was their purpose in the future, as far as possible, to employ for key positions only college men. Is this right and fair? They are not doing this for the purpose of surrounding themselves with college men, but purely as a cold-blooded business policy whose ultimate aim is to pay better dividends to their stockholders. It therefore deserves the serious consideration of both college men and men who have not had the so-called "advantage" of a college education.

The meaning of the word "educated" does not necessitate attendance at college by the person to whom the term is applied. Some man has said that to be educated means "a little knowledge of a great many things and a great deal of knowledge about one thing." Many college men are not educated when examined by this standard, on the other hand a great many people are extremely well educated who never went to college. The question therefore is really not a weighing of the value of a college man and the non-college man, but the value of having educated men in the key positions in the mill. This means the overseers, for example, must be men who know something about all the departments of the business. They must understand the problems of the dyehouse, the cotton classer, the engineer, and in the financial end of the business must respect the fact that the goods they make must sell at a profit in active competition with other mills. They must appreciate the bearing of world affairs on the business. In short, they

They start when you buy

Reserve Material or Junk

There are two kinds of scrap piles: reserve material and junk. In the junk pile all discarded metal articles are dumped indiscriminately into heaps, without the slightest regard to possible salvage value. They are just so much scrap to be broken up and melted in a cupola or furnace. The reserve material pile is quite different. The various kinds of articles it contains are sorted with particular reference to salvage. Scrap pipe of given diameter and length is racked and stacked; scrap sheet metal is piled so that it can be easily cut into desired shapes; machinery or parts that can be reclaimed are placed under cover.

Is your scrap pile one of reserve material or junk? If your pipe is simply junk, you are not getting nearly the utmost use out of your welding and cutting apparatus. Oxweld Engineers will show you how to make yours a reserve material stock if you will give them the opportunity.

OXWELD has District Engineers in every one of its thirty-five branch cities and Resident Engineers at many other points as well.

These are all men with practical training. They are all able to study your plant to see if the Oxweld method of welding and cutting offers an economy to you in production or in plant maintenance. They may even demonstrate savings on your own work.

After you purchase Oxweld injector type equipment on this practical basis these Resident Engineers continue to serve you. They suggest new uses to you; they aid you in solving welding and cutting problems; they help you on production and labor.

Back of each Oxweld Engineer is the experience of all other Oxweld Engineers, and back of all these Resident Engineers are Oxweld's extensive engineering and laboratory facilities.

Whatever your business is, if you use machinery or make machinery, you should consult one of our Resident Engineers to learn how the Oxweld method of welding and cutting can save you time or money, or both.

Send for illustrated booklet, "Oxweld Can Do It," or better still, telephone or wire the nearest branch for the Resident Engineer to see you.

OXWELD ACETYLENE COMPANY

Chicago
3642 Jasper Place

Long Island City, N.Y.
Thompson Ave. & Orton St.

San Francisco
1050 Mission Street

Oxweld

WELDING AND CUTTING APPARATUS

WORLD'S LARGEST MANUFACTURERS OF WELDING AND CUTTING EQUIPMENT

must know something else besides getting numbers even and turning out production at a fair average of cost.

This sounds like a big order for a man having the worries of the overseer. It is big for the overseer, but the corporations mentioned previously are expecting some day to make executives out of their overseers. No overseer or superintendent has the right to whimper if he has been passed by a man who has taken the trouble to look beyond his job. This sounds like the advertisements we see in the magazines attempting to sell certain business courses, yet it is fundamentally the question at issue. A man may accomplish all of this and not buy a single book, for if he can talk, and listen to the right kind of talk, he can certainly learn something besides who will win the next world's series and how little the chances are for the Republicans in the next election.

In the trade school of The Reo Motor Car Company there is a placard on the wall which reads thus: "There will always be a place for the man who knows how—but the man who knows why will be his boss."

It makes no difference if you know how to spin better yarn than anybody else in the world, or weave better cloth than anybody else in the world, if you cannot tell why you do the things that so enable you to surpass the rest of the world, you will never have the boss' job.

R. B. S. (Ga.)

Discussing the High Twist of Contributor No. 13.

Editor Cotton:

The question of "Contributor No. 13" is more or less of a poser, as my experience fails to cover 30s yarn with anywhere near 45 turns of twist. However, this may be a yarn for a special purpose about which I confess total ignorance.

Going ahead on the assumption that this question was mis-stated, I will give what I consider a fair lay-out for 30s/1 carded yarn:

Using 1 1/16-inch cotton with a twist of 26 turns per inch (twist factor 4.75), front roll 116 to 120 turns—with good preparation in the card room there should be no difficulty in getting this yarn to break 58 to 61 pounds.

B. R. S. (S. C.)

Editor Cotton:

Answering "Contributor No. 13":

For a staple, I would select 1 1/16-inch Upland cotton, for two reasons: (1) It is the most useful variety of cotton grown, and constitutes the largest portion of the world's crop, easiest to get. The diameter of this cotton varies from 0.0006 to 0.0008 inch, and its average length is about one inch. It is stronger than either the Sea Island or Gulf, its tensile strength being about 120 grains.

It has been demonstrated that by seed selection, the length of the staple of the Upland variety may be increased from 1⅛ inch to 1¼ inch.

My next choice would be Texas cotton. This cotton resembles the Upland very much, but it is slightly shorter and harsher. It is best suited for warp yarns below 32s, owing to its harshness and strength.

As regards breaking strength, 45 turns is equal to that inserted in 90s yarn, so by employing the rule to find standard warp yarn, $2{,}600 - 30 \times 3 \div 30 = 80 +$ breaking strength of 30s/1 45 turns twist.

Yes, it is advisable to make 30s/1, 45 turns twist, out of 1 1/16-inch cotton, if the grades outlined are used. But beware of the contraction, and, again, short drafts must be used. Too much friction will not do for such a constructed yarn. Intermittent drafting causes heavy and light places, and again, twist runs to the light places, so with 45 turns to the inch and the foregoing conditions, the appearance of the yarn would simply be awful. Wash (R. I.)

Editor Cotton:

In reply to "Contributor No. 13," who asked in the February number about a cotton to make 30s/1, 45 turns twist, out of, etc.—

If he took 1 1/16-inch cotton and put 45 turns of twist into it, I think the breaking weight might be about 40 to 45 pounds, for 45 turns of twist in a 30s yarn is something I have never known of. This twist in a 30s yarn is what we would call 8 to the square and it would be over-twisted. Yarn is as often weakened by being over-twisted as it is weakened by under-twisting and the day is coming when we shall put a twist in yarns in accordance with the pitches and convolutions in the fiber. I mean by this that a cotton fiber with 220 convolutions to the inch and a pitch of 43 should not be twisted the same as a cotton fiber with 150 convolutions to the inch and a pitch of 60. This may not read just right to you, but if I were discussing this thing with an audience of spinners on fine work in England, that would be the answer I should make to them if the question were asked.

The second question—whether it is advisable to make 30s/1, 45 turns twist, out of 1 1/16-inch cotton—I should answer "No." As stated before, it would be over-twisted. Take 1 1/16-inch cotton, which I purchase to make 30s warp, and we select this for making warps which we sell to other mills. We average our twists from 3.85 to 4.05 and get a breaking strength on 30s of from 70 to 74 pounds. We have others here who sell yarn in competition with us, who are supposed to have purchased 1 1/16-inch cotton, and who put from 4.00 to 4.50 twist in and their warps break 60 to 65.

I would suggest that "Contributor No. 13" try purchasing Arkansas, known as Liverpool 29.32 Middling cotton, and try my given twists. J. M. (Mass.)

Editor Cotton:

In response to the question as to what staple cotton carded I would suggest to make 30s, 45 turns twist, and what the breaking strength is; also if I think it advisable to make this yarn out of 1 1/16-inch cotton—

Forty-five turns twist is something I never heard of before, for 30s/1, the standard twist on this for warp being about 26 turns per inch, and on very hard twist yarn about 33 to 35 turns. Upon receipt of "Contributor No. 13's" question, however, we tested out a sample using our full 1 1/16-inch cotton, and find that 45 turns simply twists the stock to death. Four bobbins varying from 29.41s to 30.30s, an average of 29.85s, all broke 29 pounds. With our regular twist this yarn would have broken around 60 pounds. Accordingly you will see that it looks as if no cotton, no matter what the length, would be advisable to spin with 45 turns of twist, if any strength at all is wanted.

W. M. C. (Conn.)

Interesting Weave Room Inquiries.

EDITOR COTTON:

I should be glad to see the opinions of some of your readers on what they consider a good percentage of efficiency for automatic looms making print cloth. What I mean by this is how much of a possible 100 per cent production should a weave room make from week to week?

How many dollars, per month, would be considered a fair allowance for supplies and repairs for a weave room section of from 80 to 90 looms—automatic looms making print cloth. Of course the age and condition of the loom has a lot to do with this, but a fair average should be ascertained to keep up a section and a standard could be set for means of comparing the sections.

How many times should a slasher cloth be replaced on a slasher—the machine making warps of medium numbers of from 2,000 to 2,800 ends?

How many feet of soft waste and how many feet of hard waste should be permissible in changing a set on a slasher?

G. A. M. (S. C.)

EDITOR COTTON:

Replying to "G. A. M.," an advance copy of whose questions were sent me, I think that a well managed weave room containing automatic looms making print cloths, should average 97 per cent efficiency for the actual time run.

A section of 80 looms that has always been kept up should not cost over $25.00 per month for supplies.

We have always changed our slasher blankets once a day until recently when we have quit that system and are trying the method of not changing them until they wear out. We have been unable so far to see any difference in the result. This cannot be done, however, if an all wool slasher cloth is used.

We have always tried to hold our slasher waste down to ¾-pound per beam of 475 ends. We are not able to do this all the time, however.

K. C. F. (S. C.)

EDITOR COTTON:

From information compiled for a period of several months, I believe that a fair production on 68x72s, 4.75-yard print cloth is about 97 per cent; on 72x76s, 4.25-yard print cloth it should be about the same. An 80x80 print cloth is considered a very hard weave, and I should say 88 to 90 per cent is a fair production on this. I think 90 to 94 per cent is a good production on 64x60s, 5.35-yard print cloth, running day and night.

This is in answer to the advance copy of the question of "G. A. M. (S. C.)" who asked for a good percentage of efficiency for automatic looms making print cloths.

Answering his further questions, as to a fair allowance for supplies and repairs for a weave room section, on print cloths, I should say that if looms are kept in first-class shape, and no patched supplies are used, I consider for a section of from 90 to 95 looms, an allowance of $55.00 to $65.00 per month. There are many mills that are not spending this much per section, but their looms are gradually depreciating. $60.00 per month should keep 95 looms practically new so that they can produce the highest production and best quality of product. It is probably possible to run 94 looms on $45.00 or $50.00 per month.

With reference to the replacing of wool blankets on slasher squeeze rollers, I should say that a blanket of about five yards should run from 175 to 250 hours. About 200 hours is a fair average for a 16-ounce all wool blanket running at a speed of 38 yards per minute.

There are many things that will affect the life of a wool blanket on a slasher. The speed, as mentioned, is of course one of the big items, because you can realize that a roller makes many more revolutions in delivering 38 yards per minute than it would in delivering 25 yards per minute; and of course the more revolutions a roller makes in a given length of time, the sooner the blanket will wear out.

The starch and sizing ingredients, of course, affect the life of the blanket greatly. It is also possible to make blankets last much longer by keeping them from getting too hard at night when the machine is stopped. Some mills have a short hose attached to the water line which comes to the size box, and, after stopping the machine at night, they use this hose to wash the blankets on the squeeze roller, by turning on the stream of water and gradually turning the roll. This washes out a considerable amount of the starch in the blankets and leaves the blankets saturated with clean water. Then in the morning, the blankets are thoroughly wet again, before starting the machines.

It is the custom with some other mills to have two sets of blankets for each roller, and to have one blanket in a tub of water while the other blanket is running on the machine. These blankets are alternated each day, or probably every two days. This adds greatly to the life of the blankets, and also causes the yarn to take on a little more weight in starch, because the blankets are always soft, and all slasher men know that a new blanket will always put on more starch or weight than an old blanket. These are only a few of the many items which might have an effect upon the life of a slasher blanket.

Contributor No. 53.

(In view of the great divergence of these two opinions we urge all readers with experience or figures on these special lines to express their views.—The Editors.)

"Lay Off" the Tension Gears.

EDITOR COTTON:

Some carders find fault with the roving frame on account of not being able to control the tension when the humidity runs to the extreme. They often have all the tension gears changed, thereby causing the roving to stretch by increasing the tension between the delivery rolls and the bobbin with the result that the spinner is forced to change his draft in order to maintain numbers. Then, when these temporarily changed weather conditions are over, the roving frames become too tight and the ends break down, and the carder then goes to work and changes those tension gears and the spinner must again alter his draft in order to maintain his numbers, and so on down the line at each change in the weather. With the net result that the finished cloth is not as even as it should be.

I claim that there is not a time when the tension gears on a roving frame need be changed, provided there is no mistake made when changing from one hank roving to

The UNIVERSAL needs of the *TEXTILE INDUSTRY*

The resources of men and materials are drawn upon to convert animal and vegetable fibres into finished fabrics.

Chemicals of every description play a stellar role in the process and their importance in the industry justifies the exercise of the greatest care and judgment in selection.

It is a source of pride with us that R & H Chemicals are used so extensively in this fundamental industry. It is true they merit the endorsement — for each R & H product is a standard of chemical quality — made dependable through a system of manufacture that insures absolute uniformity.

And back of basic chemical purity is the R & H reputation for reliability extending over a period of forty-one years.

A few of our specialties

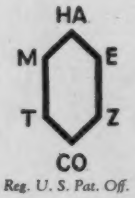
ZINC DUST
LACTIC ACID
OXALIC ACID
CHLOROFORM
ACETATE LEAD
ANTIMONY SALTS
BARIUM CHLORIDE
GLAUBER'S SALT
ACETATE OF SODA
CAUSTIC POTASH
CARBONATE POTASH
TARTAR EMETIC
SODIUM NITRITE
SODIUM PHOSPHATE
FORMALDEHYDE
SODIUM BISULPHITE
CARBON TETRACHLORIDE
TRI SODIUM PHOSPHATE

THE ROESSLER & HASSLACHER CHEMICAL COMPANY
CHEMISTS
NEW YORK

42nd Year

The ROESSLER & HASSLACHER CHEMICAL CO.

709 Sixth Avenue, New York



Reg. U. S. Pat. Off.

Indanthrene
Thio-Indigo
Helindon
Hydron
Algol

and other vat dyes will be imported by us direct from the manufacturers

Reg. U. S. Pat. Off.

A complete line of

Acid, Basic, Chrome, Sulphur and Direct Colors, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble and Leather Oils

Manufactured by

Consolidated Color & Chemical Co.
Central Dyestuff & Chemical Co.
Williamsburg Chemical Co.

And other American Manufacturers

Special dyestuffs
for
Acetate Silk

H.A.METZ & CO. Inc.

122 Hudson Street, New York, N. Y.

128 Oliver St., Boston, Mass
301½ West Trade St., Charlotte, N. C.
449 N. La Salle St., Chicago, Ill.
132 Chestnut St., Philadelphia, Pa.
316 Turk's Head Bldg., Providence, R. I.
20 Natoma St., San Francisco, Cal.

another. As "A. B.," in the February issue is fresh off the bat, I will take his remarks as a basis. He has a very good conception of the roving frame and about the only mistake in his article is about changing the tension gear. It will be remembered that "A. B." said if the ends became too tight the tension gear should be changed. Let me call his attention to the fact that it depends on the size of the bobbin whether the tension gear is responsible for the tightness or the slackness of the ends.

Right here I will give a few points to be considered. When starting the machine after doffing, if in a short time the ends become too slack or too tight, there has been a mistake made in making the change from one number to another and the tension gear should be changed and the proper tension secured. After this is done, the tension gear should not be changed regardless of the weather conditions, provided the proper relative humidity is maintained in the room at all times.

However, if the proper humidity is not there, the carder can look for tension trouble, not only on his fly frames but also the web on the cards will bag and he must in extreme cases not only change the fly frame tension gears but he is forced to raise the doffer comb in order to stop the bag of the web at the card.

Getting back to the subject—if the frame runs good until the bobbins are half or three-fourths full the trouble is not with the tension gears but in the lay. If too tight when from half to three-fourths full the lay is too close and should be opened. If too slack the lay is too open and needs closing. But let that tension gear alone!

Even in extreme conditions of humidity, the tension gear should not be bothered. If the work looks like it is going to pieces, if the ends begin to sag, close the lay just a little. This will make it right and the spinning will not be affected at all. There is only one reason for this and that is that in wet weather, when the humidity runs to the extreme, the cotton will lay much closer than in dry weather, with the result that the roving is smaller in diameter than when the weather is dry and there is much humidity in the room.

But the carder mustn't think he can do it all at the roving frame—he must keep all the processes straight from the breaker picker to the roving frame and the tension will be much less. I remember some time ago one of the writers made the statement that "I take very little stock in percentage of regain and humidity." This man also has fly frame trouble and he tells why. Just as long as he maintains that attitude he will continue to have fly frame difficulties.

I know the foregoing is straight dope because I know of a mill where the tension on the fly frames has not been changed in four years.

T. A. A. (S. C.)

The "Venturafin" unif heater is a new product of the American Blower Company, Detroit, Michigan, that has a number of interesting and unique features. One feature is that it produces a heating capacity of 150,000 B.t.u. per hour. In addition, it has a novel construction, with a helical fin adding to the surface of each tube. The unit is lightly constructed, and a good feature is its flexibility of adaptation to installations of all kinds.

Apportioning Work per Operative.

Editor Cotton:

I would be glad if some of your readers, running on about the following work, would advise how many frames spindles per girl or operative are run in average mills in good condition on these lay-outs.

Spinning 36s warp yarn—

Cards, 65-grain sliver—How many machines per tender?

Drawing, 65-grain sliver—How many deliveries per tender?

Slubber, 0.5 hank roving—How many spindles per tender?

Inter Roving, 1.4 hank roving—How many spindles per tender?

Fine Roving, 4.5 hank roving—How many spindles per tender?

Spinning 36s.

Spinning 23s warp yarn—

Cards, 65-grain sliver—How many machines per tender?

Drawing, 65-grain sliver—How many deliveries per tender?

Slubber, 0.5 hank roving—How many spindles per tender?

Inter Roving, 1.5 hank roving—How many spindles per tender?

Fine Roving, 4.2 hank roving—How many spindles per tender?

Spinning 23s.

How many combers can a tender take care of in the average mill? How many ribbon lap machines? How many sliver lap machines? I. K. (Mass.)

An Old Timer Says—

(*Continued from page* 601.)

with Sam about John. The first thing you know, Sam and John both are getting out more cloth—making more money.

Multiply this one little illustration by all the weavers or frame hands or spinners you have and see how that old production record will fade away.

To win at any kind of a game is a great pleasure. There is no game you could get more pleasure (or money) out of than your work. Of course this reasoning is just plain common sense—

Well, what in the devil is Sy-kol-ogy?

Care of Intermediate and Jack Frames.

Editor Cotton:

In a previous letter I discussed the care and operation of slubbers, and will now take up the intermediate, speeder and jack frame, as these, unlike the slubber, carry roving in the creel, and have to be dealt with somewhat differently.

There is a very fine art in the operation of a speeder. This machine should be kept in line and perfectly level the year around. We know that when a machine is out of line and out of level it consumes more power, there is more breakage, the oil does little good, production is low, and

"THE FINISH SELLS THE GOODS"

The art of finishing goes steadily forward to impressive successes. Out of competition are necessarily born fabric effects that create new and extensive demand.

BRUNZOL PRODUCTS are helping many of your competitors by imparting original and saleable finishes to every class of fabric. Their scientific construction makes certain the obtaining of positive and profitable results.

The BRUNZOL PRODUCTS Formulae Booklet will help you secure new finishes. Send the coupon now.

THE NEW BRUNSWICK CHEMICAL COMPANY
REPRESENTATIVES AT BOSTON-PROVIDENCE-CHATTANOOGA-ATLANTA NEWARK, N.J.

SEND FOR SAMPLES OF BRUNZOL PRODUCTS

A sample page from the Brunzol Products Formulae Book

Brunzol Tragantol

This product—like all others of The New Brunswick Chemical Company—has been developed to meet a definite need in textile processes. Because of its proved efficiency Brunzol Tragantol is preferred over Gum Tragacanth and is used in the same proportion.

Where Brunzol Tragantol is employed there is no extra work involved nor loss of time in preparing the solution as it can be made at once without previous cooking.

Brunzol Tragantol is especially efficient in warp sizing for the fact that it lays the fibre and prevents shedding makes it a valuable material in sizing processes. Goods going abroad stand handling and storage better when finished with Brunzol Tragantol.

When preparing the solution put the Brunzol Tragantol in a pail and slowly work the water into it, but only as fast as the gum absorbs the water.

FORMULA

One pound of Brunzol Tragantol dissolved in five to ten gallons of water to meet individual requirements.

The New Brunswick Chemical Co.,
87 Doremus Ave., Newark, N. J.
Gentlemen:

Please send me free booklet of Formulae For Improving Finishes of Fabric with BRUNZOL TRAGANTOL.

Mr. .....
.....

THE NEW BRUNSWICK CHEMICAL COMPANY · NEWARK, N.J. · NBC

cost high. Let's overcome these defects, or prevent them.

If we have our frame in line and level, the jackshaft wants to be in line and level with the frame to prevent any binding in bearings. Then dowel pins should be put in the stands to prevent their getting out of true and causing breakage of some part of the machine. The top cone should be lined and leveled with the frame and dowel pins put in the stands to prevent their getting out of line and causing breakage or heaviness of the frame to pull.

The lift shaft is a very important part in connection with this machine. The carriage should be lined and leveled and the arms that fasten the carriage to the lift rack and lift gear on the lift shaft, each connection should be securely fastened with bolts and dowel pins put in to prevent their getting out of true. All gearing in the head and compound should be set properly, none too deep and none too shallow. The cone belt should be kept in good shape, using the endless type belt. All spindles should be plumbed and bolsters should be mopped out four times a year. The spindle shaft gear should be set 4/5 to the bottom, the bobbin shaft gear should be set 4/5 to bottom. This will prevent the gearing from wearing and also from jumping.

Flyers should be of the right weight for the roving and speed used. The hollow tube through which the roving passes should never be scarred by using a knife blade to remove a choke, but a tool of copper wire should be used for this purpose. The weights on the top leather rolls should be uniform and heavy enough for the roving being run and the stock being used. The weighting of the top leather rolls means more than we sometimes think.

The roving traverse should traverse the whole length of the leather roller without running the roving out at the sides. This will prolong the life of the top leather rolls, lessen the cost of the room, and make an evener piece of roving for the spinning department.

We usually know whether the lay gear, twist gear, and draft gear, are right, but the tension gear must also have its share of consideration. The ends should never be allowed to run tight, but should sag just enough for us to know that the roving is not stretched. Stretched roving is an evil; let's weed it out by watching and changing the tension gear when it should be changed.

As to the setting of the rolls, these want to be set in accordance with the staple being run. I have been very successful with the following settings: Back to middle rolls, 3/8 inch wider than the length of the staple; front to middle, 3/16 inch wider than staple—using just enough twist to unwind at the next process.

The steel rolls must be kept in line and level; the top leather rolls should be set in the center of the steel rolls and be absolutely parallel with them. When the flutes become badly worn they should be refluted to insure a good grip for the top leather roll so it will draw the stock properly.

None of the stirrups should rub the top or bottom roll, but should hang clear. A good way to get the top rolls parallel with the steel rolls is to have a gauge made on the order of a T-square so both bosses of the roller can be gauged at the same time. Then take a cap bar gauge and set the middle and back rolls as desired.

The cleaning of flyer frames is another thing to be watched. The carriages and bottom boxes and head ends should be cleaned at least twice a year and all old oil and grease cleaned out of the boxes and bearings and replaced with new lubricant of a good quality. The steel rollers should be cleaned at this time and grease put in the bearings and stands.

Every oil hole in the fly frame should have two or three drops of a good grade of oil every morning and all fast revolving parts twice a day. Spindle steps should be oiled every 15 to 18 days with six or eight drops of a good quality spindle oil. The tips of rollers should have one drop of oil every other day to prevent wearing the cap bars.

A. B. (Ga.)

Bleaching Goods for Rubber Plants.

Editor Cotton:

In the November number of Cotton, "W. B. (Maine)" speaks of neutralizing the bleached fabrics when the goods are afterwards to be coated with rubber. The writer would like to know what rubber goods are made with bleached stock as a base and what advantages are gained by bleaching fabrics afterwards to be coated with rubber.

K. G. R. (Ga.)

Editor Cotton:

The article in question, i. e., in the November issue of Cotton, says nothing about *coating* goods with rubber. It refers to *rubberizing* and *vulcanizing* processes and refers especially to canvas shoes which are largely made of bleached canvas and rubber trimmings and soles, all of which are rubberized on and then vulcanized. The advantage gained by bleaching is that the shoes are *white* except the rubber trimmings. The Hood Rubber Company uses more than one million yards per year of 36-inch, 11-ounce duck for this purpose.

W. B. (Maine)

The Proper Speed for Card Grinding.

Editor Cotton:

Replying to "P. T. E." in February Cotton in regard to the proper speed for traverse grinders, I would say that his speed of 742 is about right. I wouldn't advise going below 600 r.p.m., as it is necessary to have at least this speed to get good grinding. Try to grind a piece of steel on a slow running emery wheel, and note that there will not be any sparks and that the object being ground will have to be pressed hard to make the wheel cut it at all.

Inasmuch as this is true the traverse rolls have to be run at a pretty high speed in order to grind off the teeth. But it seems that "P. T. E." isn't grinding heavy enough. In order to get a good diamond or needle point it is necessary to press the roll or grind pretty heavy. This gives the desired point, then the traverse motion tends to grind the sides of the teeth off, but will not do this unless the pressure is great enough to not let the teeth stand up in the natural position.

When grinding, the rolls should be set by sound and also by sight, or to where the sparks are uniform the entire width of the card. Then, as stated above, the pressure of the roll revolving gives a chisel or bevel point, then the traverse grinds off the sides, hence a good needle or diamond point.

Bondaron
TEXTILE LEATHERS

Bond Leathers Give Longest Service

There is one best way to judge textile leathers—by their records. We have records from well known mills throughout the country showing the remarkable endurance of BONDARON products.

Check Straps, Lug Straps, Picker Straps, Harness Straps, Round and Flat Belting and other textile specialties made from this tannage last often three to five times longer than ordinary leathers working under the same conditions.

In the secret process by which BONDARON is tanned the strength of every fibre is preserved and developed. No pains are spared to make it the most serviceable textile leather in the world.

Besides the great tensile strength and resistance to wear, Bondaron has unsuual flexibility, and when made into belting for difficult drives gives most excellent service, delivering full power with practically no stretch.

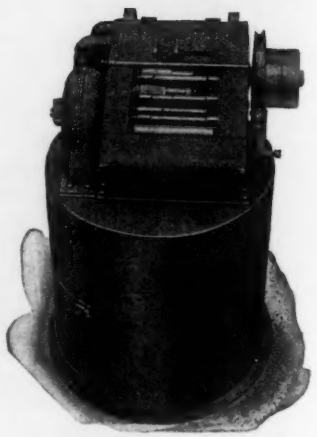
We can furnish all leathers for use in the textile industries. Send us your orders.

Manufactured Exclusively by

Charles Bond Company
Leather Importers, Curriers and Belt Manufacturers
617-619 Arch St. Philadelphia, Pa.
THE LEATHER WITH THE HAIR ON
ORIGINAL AND GENUINE — BONDARON

Make 1924 a Cheap Year For Cleaning Roving Bobbins

During 1923 a number of mills substantially reduced their cost of cleaning roving bobbins by installing Termaco machines.



A Termaco not only cleans bobbins more quickly than the hand cleaning method but it adds to the life of the bobbins. The waste is not cut off but is carded off and is kept together where it cannot be blown about the mill.

Mills have found that the Termaco easily cleans upwards of 30,000 roving bobbins each working day.

With a Termaco your mill can make 1924 a year remarkable for its lowered cost of cleaning bobbins.

The Termaco gives uninterrupted service year after year. Ball bearings are used on all high speed shafting, all gears are cut gears, heat treated steel parts are used where necessary for long life; each machine is built with only the best material and by the most skilled workmen. Each part is made in jigs and templates to afford perfect and rapid interchangeability of parts.

There are no exposed gears which might catch hold of clothing or injure a careless operator. Anyone with slight mechanical knowledge can keep a Termaco in perfect operating condition and anyone who can drop a letter in a mail box can be taught to feed roving bobbins into the machine.

The cost of operation and maintenance is a negligible item in comparison with the savings effected by the machine.

Write our Engineering Department today for full details regarding the Termaco and the lowered cost for bobbin cleaning it will effect for your particular mill. Such information will not obligate you in any way whatsoever.

TERMACO

Every machine trademarked "Termaco" is sold under a binding guarantee as to workmanship, material and operation.

The Terrell Machine Co., Inc.

ENGINEERING DEPARTMENT CHARLOTTE, N. C.

General Supply Co., Danielson, Conn., Representative for N. Y. & N. E.
(Complete stock of parts at all times carried by northern representative.)

Another point that should be watched is the quality of emery fillet, and the moment it shows glazed or oily is time to put on new emery, whether it has ground two cards or a dozen, for when the emery loses its point its usefulness ceases. Number 40 emery has given me the best results.

A mill should never try to run a set of rolls that are out of true, for grinding is done to true up surfaces as well as to sharpen, and with a set of lop-sided rolls it is impossible to get anything except a card in the same shape.

Also, when grinder rolls are set they should be watched, for they can be set to grind pretty heavy and after a few hours the cut will be ground off and the roll will be found to be just tipping the points which will cause a blunt point and sometimes it is necessary to pull down on the rolls several times during the day to get the desired results.

It could be that "P. T. E." has ground his cards down to the knee of the tooth, as it is very difficult to get the desired point when this is the case for it makes the tooth too harsh and it will not press forward to permit the roller to shape it. In other words, when the clothing is new, the distance from the knee to the point, forms four-sevenths of the tooth and from the knee to the foundation or crown is three-sevenths of the length.

But as to speed, I don't think he is too high for we are running ours about this speed of 742 r.p.m. and think we are getting good results. I would be glad to hear from some of the other readers, though—let's get up a discussion and we will all learn something. U. D. (Ala.)

Editor Cotton:

The speed of card grinding rolls is the subject of a question from "P. T. E." in the February number. He says, "I have been running my grinding rolls about 742 r.p.m., and find that we do not get good results."

On reading his question I timed my grinding rolls, and find them running 740 r.p.m. and we are getting excellent results, so "P. T. E.'s" trouble must not be in his speed.

Speed is everything in grinding, not only of the grinder but of the article under treatment. The speed of cylinders and doffers has, at various times, been a controversial question, but as excellent results have been gained by running the cylinder at working speed (doffers proportionately), this speed has now been adopted almost universally: 50-inch cylinders, 160 to 170 r.p.m.; doffers, about 340 r.p.m. Without question, the speed of the grinder should be fast. This applies to both traverse wheel grinders and long grinding rolls. The speed recommended is not less than 550 up to 750 r.p.m. for grinders seven inches in diameter; other diameters in proportion.

As I have already stated in these columns, the whole of the grinding power is contained in the emery grain, accounted for by the minute eruptions upon the surface, resembling a crater-like formation.

When the sharp points of these eruptions are worn off or struck away by contact with the card-teeth, and the grains assume a polished effect, the emery is no longer capable of doing its work to advantage, and it is better, and in the end cheaper, to replace it with new.

It is false economy to attempt to run the grinding substance any longer than its capacity to do good work will allow, it is far cheaper to replace the emery frequently than to let it run too long; in the latter case the card clothing and the quality of the carding both suffer to an infinitely greater degree than the so-called economy exercised can compensate. The emery may appear good to the eye, and for ordinary uses as an abrasive other than card-grinding it will undoubtedly still retain much of its usefulness, but I want to repeat that for card-grinding, smooth emery is useless; in fact, it is worse than useless, it is harmful—and I do not say this without practical reasons.

When emery is new and the grains are replete with sharp, clean abrading surfaces, the contact with the card points produces instantly a sharp, hissing sound, and this facility to render audible the abrasive contact makes it an easy matter for the grinding man to establish the right amount of "cut" in setting his grinders. The emery, when worn, having lost the keen, abrading properties in the shape of the minute surface-points which are all that is useful for the purpose of grinding cards, on the contrary does not respond to the contact so readily, and as the operator has only his hearing to guide him in grinder-setting, there is always a danger of the grinder being set too deep, causing buckling of the wire, hooked points and broken-out teeth, which I think is most of the trouble experienced by "P. T. E." Would be glad to see another letter from him, at any rate. Wash (R. I.)

Editor Cotton:

In reply to the question of "P. T. E." as to the best speed for card grinding rolls, I say between 400 and 500 r.p.m. is the best speed for traverse rolls, and for the flat drums, between 200 and 300 r.p.m. In grinding care should be taken not to grind too heavily. This is the main fault in lots of mills—as well as being too frequent in getting around. If a card is ground once every twenty days it is often enough.

And one-half day's grinding is plenty at one time. If this is done the cards will show better work. Some of our largest mills get around only once every thirty days and they always have good work from these cards.

Care should be taken to see that the emery is changed often and only medium emery should be used on the traverse rolls.

In lots of mills I have personally seen small white specks in the web caused by heavy grinding. The points are hooked and the cotton will hang on this hook and go around the cylinder four or five times and then let go and come into the web causing the specks. The best way to tell whether the cards are doing good work is to go to the warper and look at the yarn there.

I would say to "P. T. E."—Do away with your flat horny points by cutting the r.p.m., grinding more lightly and not getting around too often. J. F. C. (R. I.)

Editor Cotton:

In the February issue "P. T. E." requests a discussion of card grinding roll speeds and states that he cannot get a good needle point on the wire with fast grinding. I note that his roll speed is 742 r.p.m. This is not excessive, and I think approaches the average rather than the exception, and I believe he will find other causes for that flat, horny feel on the wire. Some of these I will mention.

First, a slow motion of the traverse or recurrent movement; second, heavy grinding of the wire; third, allowing

ARTIFICIAL SILK

This is comparatively a new material for fabric making but is rapidly growing in favor for mixed fabrics, especially with cotton mills on all sizes of average numbers, fine and coarse. The artificial silk yarn is so different from yarn of any other material that it requires special attention to the harness-eye in order to make a satisfactory fabric.

From the very first, when this new material began to be used, we have been making heddles for artificial silk yarns and have continued to improve and perfect the harness-eye until now it is generally conceded that any mill, whether making cotton, silk or other fabrics, can without hesitation depend upon our artificial silk loom harness to make a fabric with entire satisfaction. And the beauty of it is that these heddles are interchangeable for use on cotton, silk, and yarns of other material just as well.

STEEL HEDDLE MFG. CO.

GREENVILLE

"Duplex"
Loom harness—complete
(With Frames and Heddles fully assembled)
Heddles
Harness Frames
Selvage Harness
Leno Doups
Jacquard Heddles
Lingoes

PHILADELPHIA

SOUTHERN PLANT

Greenville, S. C.

HAMPTON SMITH

Southern Manager

PROVIDENCE

Drop Wires
(With
Nickel-Plated
Copper-Plated
or Plain Finish)
Improved Loom Reeds
Leno Reeds
Lease Reeds
Beamer Hecks
Combs

DIXON'S

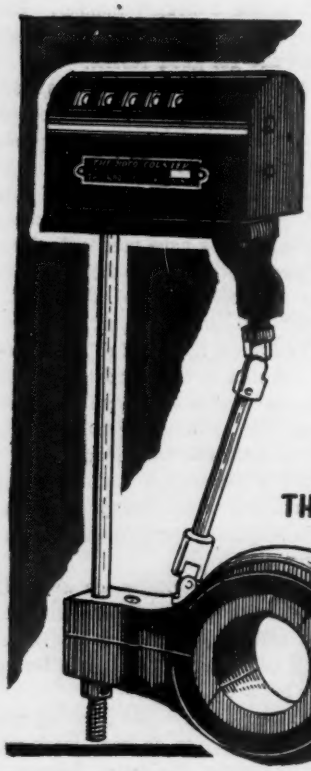
Dixon's Flake Graphite reduces friction in steam cylinders and valves, lengthens the life of packing rings, prevents scoring, reduces blowing, and minimizes oil in the exhaust. Used in compressor cylinders oil is prevented from getting into the air lines and receivers, and discharge valves are prevented from carbonizing and clogging.

Lower lubricating costs and improved operating await your investigation of Dixon's Graphite Lubrication. May we send you Booklet 34-C?

Joseph Dixon Crucible Company

Jersey City New Jersey

Established 1827



Since 1919

1827

ROOT

Pick Counters were installed in One Mill—and it's a very prominent Blanket Manufacturing Concern.

(name upon request)

THE ROOT CO.
BRISTOL, CONN.
SOUTHERN OFFICE
413 S. CHURCH ST. CHARLOTTE, N.C.

A Textile Plant cannot grow without Roots.

too many cards to be ground before renewing the emery fillet; fourth, allowing a card to grind too long; fifth, he will find it advantageous to change the number of emery used occasionally from, say, No. 40 to No. 7 and vice versa, using the No. 7 emery about every fourth time the card is ground. This will eliminate continual shaping the point of the wire from fine or No. 40 emery and renovate it to as near a needle point as it is possible to accomplish. We all often refer to card wire as possessing a needle point, but if it is carefully examined under a glass there is found a considerable difference between its shape and that of a needle point.

A card cylinder 50¾ inches in diameter over the fillet, with a circumference of 159 inches and running 165 r.p.m., gives a surface speed of 26,235 inches or 2,186 feet per minute. Using a seven-inch diameter traverse grinder roll with a circumference of 22 inches, revolving 750 r.p.m., gives 16,500 inches or 1,374 feet surface speed per minute. It can be seen that 3,560 feet is the total surface passing under the action of the grinder roll per minute. Then with a 27¾-inch diameter doffer, circumference 87 inches and a speed of 280 r.p.m., we have 24,360 inches or 2,030 feet surface speed per minute. A seven-inch grinder roll, circumference 22 inches, and a speed of 700 r.p.m., gives 15,400 inches or 1,283 feet surface speed per minute—making a total surface passing under the action of the grinder roll per minute in this instance 3,313 feet.

These are the speeds I have adopted for best results. After several years' experience with various kinds of card fillets, I am convinced that all wire does not have the same temper, and fillets of the same date of installation in a room will grind down differently with identical treatment.

Heavy grinding is destructive to wire of any count in several ways as well as the foundation having the elasticity decreased. New emery will invariably strike sparks at the touch of the wire but these will soon disappear if the roller is not set too heavy. An old card gauge (35 is preferable) should be inserted between the wire and grinder roll on selvages of fillet at each side of the card, and the roller traversed across the surface by hand before starting to grind. This makes sure there is no contact and assures the same nearness of the roll to the wire all the way across the surface. This action should be repeated at the doffer. Then when the card is started, grind medium, (so that a brisk buzzing sound may be heard across the entire surface of the wire), setting the grinder roll on the cylinder to work first. This avoids confusing the sound from the doffer with that of the cylinder which is more difficult to adjust the grinder roll on than the doffer. The traverse should be kept moving in opposite direction to the cylinder and doffer while setting the grinder and only ten cards should be ground with one set of emery regardless of the apparent good condition of the emery. Its cutting qualities are gone. The traverse roll should change its direction at each end of the hollow shell every ten or twelve seconds across a 40-inch card. If the recurrent end movements are much slower than this the wire will take on a noticeable wedge shaped point. The solid or drum grinder for flats should make about 800 r.p.m. and be used for flats only, except in case of severe dullness or accident. Six to eight hours is sufficient grinding. And the time to grind is before the wire needs it; never wait until it is dull. W. V. J. (N. C.)

Editor Cotton:

In endeavoring to answer the questions of "P. T. E." concerning speeds for grinding rolls and the effect of the speed on good grinding, I shall assume that his rolls are approximately of 7-inch diameter which is, I believe, practically the standard size now.

There is no question but that the speed of the grinding rolls should be fast, but as to the exact limits as to high or low speeds, I cannot say. However, I believe that grinding rolls of 7-inch diameter may be run within the limits of from 550 to 750 r.p.m., other diameters in proportion. The cylinders are run at their normal working speed at from 160 to 170 r.p.m., the doffers at a speed higher than their normal working speed by a considerable amount, approximately 340 r.p.m.—with a cylinder 50 inches in diameter and doffers 27 inches in diameter.

After reading "P. T. E.'s" inquiry I decided to find out at what speed we were running our rolls and I found that traverse rolls were running at approximately 690 r.p.m., with a cylinder speed of 168 r.p.m. "P. T. E." will note that this is approximately 50 r.p.m. less than the speed of his grinders, which he says run at approximately 740 r.p.m. He did not give his cylinder speed. (Note that "P. T. E." is running his grinders close to the maximum of the range I have suggested, namely 750 r.p.m.)

In regard to his complaint about the flat, horny feeling point, I cannot say whether or not high grinding roll speeds would cause this. I have heard, however, that too fast grinding resulted in hollow grinding, whereas too slow grinding resulted in grinding a spiral. These are facts that I mention for I have seen carders cut down their roll speeds to advantage in grinding.

Now with the traverse rolls, due to the deflection of the wire sideways in the grinder traverse, and the forward motion on the wire from front to back due to the rotary motion of the grinder, we obtain as near as possible a side ground point as can be obtained with surface grinding. The traverse wheel will not result so readily in a fusing of the wire as with the long dead roll. With the traverse roll we get a more even wear of the emery resulting in a truer surface of the card wire, in preference to the long grinding drum.

"P. T. E." will note that I am digressing to some extent from his question, and mainly because I do not think all of his troubles in grinding are a result of too fast a grind.

The question of grinding, as "P. T. E." probably knows, is affected largely by the class of cotton being run, counts being spun, and amount being carded. Frequent grinding with light setting should be the practice. However, I wish to suggest at this time that by light carding I do not mean so light as to simply top and polish the wire, but heavy enough so as to cause an audible "hiss" without sparking noticeably. Too heavy grinding strains the wire and tends to melt or fuse the wire.

"P. T. E." should see to it that his cards are properly set for good work. Good grinding, with poor settings, will never turn out good results. Now I think if "P. T. E." will reduce the speed of his rolls a shade to about that which I have mentioned as giving excellent results—and observe the following facts—he will soon be writing to Cotton to tell us how his grinding and the quality of his work have improved. Here are some pointers for him:

Remember the surface ground takes its surface from the grinding instrument. You can never get good results if the grinder rolls are not in proper condition. This means keeping the grinders well covered at all times, working parts in good condition, grinding light—but not too light—and hiring a first-class grinder, a man who can grind and set, a man who has a 'touch or feel,' so as to secure the closeness of a setting without facing or dulling the wire.

These points are given from actual practice, as I have had considerable experience in this and have also discussed this query with carders who know. I should be glad to have "P. T. E." tell us how he comes out. Also let's have writers like "Wash" discuss this question.

Bert (R. I.)

To Prevent Waste on Short Chain Beaming.

EDITOR COTTON:

"R. H. (N. C.)" asks if there is any way to prevent waste on account of pieces or sections running out unevenly on short chain beaming. This brings to mind the same old trouble that has been discussed in COTTON for many months on warping and slashing.

"R. H." does not give one much to work on, but we will assume his 400-end chains are from 1,200 to 4,000 yards long and each chain comes from the warper exactly the same length, as I believe they do. But go to the dyehouse and watch one set of warps running out at the boiling box, to see if they all run off together. If they do, that is a miracle.

Now this running out uneven at the dyehouse does not by any means tend to make one warp longer or shorter than another. The warps that ran out first were and are still just as long as those which appeared longer. The best answer I know of to prevent this unevenness, in running off beams in sets at a slasher, doubler, dressing machine, or long or short chain beaming, is human tension. "R. H." must at some time in his beaming experience have noticed a beamer tender get two splits from the same warp and lay in with other colors and find at the end that one of the two pieces mentioned had run out before its mate, and they were both split from the same length.

I have had lots of just such experiences as "R. H.'s," having worked in one room with over forty short chain beamers—English hand dressing—and nearly all pattern work from two to nine colors, all warping done, Denn warping 1,920 ends, 1,000 yards, stock chains. That means all pattern pieces had to be split. Solid warps were split in two and beamed one and one; that is, two in a dent, one thread from each piece, and I have seen beamers have as much as five yards left over on one of the halves, which goes to show that all the trouble "R. H." has been up against can be remedied at the beaming frame. There are several ways to determine when beaming from two colors up, which piece is too tight or too slack. One way is to tie a small string around each piece at the same place just before entering the drums or tension. Then notice their position when they come up to the raddle. Another way is to have someone run the frame while the beamer tender feels each piece separately as they come from the drums. One can get accustomed to even tension by feeling. Of course it will be a miracle to get all the warps to come out even, but more care taken in placing the warps in the drums, and knowing just how to put more or less tension on any one piece as it may require, will help reduce waste and make a better piece of cloth.

Mack (Ga.)

Rules for Cleaning the Spinning Room.

EDITOR COTTON:

I believe that a large part of the turnover in the spinning room is caused by a misunderstanding or a lack of understanding of cleaning methods or by a failure to have some set standard for doing this important part of the spinners' work.

With this thought in mind, several years ago I worked out a set of rules for cleaning up which I applied and which have proved very satisfactory. Every new worker coming into the spinning room is taught these rules and thoroughly understands them before starting in. In the hope that possibly they might be of interest to others contemplating the inauguration of such a system, I am submitting them herewith. I would be glad to see some discussion on this matter from other men submitting their rules.

Here are mine:

DAY SHIFT.

Pick leather rolls A. M.
Wipe bottom roving A. M.
Wipe backs 9:00 A. M. and 3 P. M.
Brush rails 8:00 and 11:00 A. M. and 3:00 and 5:00 P. M.
Pick clearer boards after brushing rails.
Wipe guide boards each hour.
Pick separators Wednesday and Saturday.
Pick steel rolls and weights Thursday.
Pick stands Friday.
Clean gears Saturday.

NIGHT SHIFT.

Pick leather rolls P. M.
Wipe top roving P. M.
Wipe backs 9:00 P. M. and 3:00 A. M.
Brush rails 8:00 and 11:00 P. M. and 3:00 and 5:00 A. M.
Pick clearer boards after brushing rails.
Wipe guide boards each hour.
Oilers clean overhead Wednesday and Friday.
Doffers clean heads and rockers twice a day; middle cylinder bearing once a day.

This is in a mill making an average of about 22s yarn.

M. C. F. (Ga.)

Wishes Some Discussion on Cone Winding.

EDITOR COTTON:

I have been reading COTTON for some time but have not seen much on cone winding. I should be very glad to see some discussion on this process, regarding the methods of operating the machines, some of the problems run up against and how they were overcome, and anything else of interest in connection with this machine. I am sure this would also be of interest and help to other mills operating cone winders, and I hope some of your readers will start the ball a-rolling.

L. C. S. (Ala.)

Are You Throwing Away $5,000 a Year?

SPOOL losses are the result of heads breaking, splintering or coming off.

When this occurs the spool is a dead loss. The yarn—worth several times the cost of the spool—is wasted; for salvaged yarn sells for about one-fifth its value.

The waste, therefore, from a damaged spool, is conservatively estimated at fifty cents. If you are running fifty thousand spools and using ordinary spools whose life is estimated at five years, you are losing $5,000 a year.

Lestershire *Vulcanized* Fibre Spools put this money in your pocket instead of the roving can. Their heads do not break, splinter or come off. And the life of a Lestershire Spool is guaranteed for 20 years.

Let our salesman explain in detail how Lestershire ***Vulcanized*** *Fibre Spools increase profits. And send now for booklet.*

Unconditional Guarantee
Lestershire *Vulcanized* Fibre Spools are guaranteed unconditionally.

LESTERSHIRE FIBRE SPOOLS EVERLASTING

LESTERSHIRE SPOOL & MFG. CO.

146 Baldwin Street
Johnson City, N. Y.

Also manufacturers of high grade wooden spools of every description

Southern Office:
32 So. Church St.
Charlotte, N. C.

Creo-pine

Trade Mark Reg.

SUB-FLOORING

Never Needs Repairing

Specified as the standard of comparison by leading Construction Engineers

GENERATIONS after the builders have passed on, Creo-pine sub-flooring will be found in place, firm and unimpaired.

Every piece of Creo-pine sub-flooring is milled from carefully selected, felled alive, sound Southern yellow pine, air seasoned and free from spongy spots.

Creosoted by the S.W.P. Vacuum Pressure process, which first draws all moisture or sap from the wood and then impregnates the pores with pure creosote oil, Creo-pine sub-flooring is impervious to decay or rot.

Leading construction engineers frequently designate Creo-pine sub-flooring as the standard of comparison in their specifications.

Build for permanence. Lay your sub-flooring once and forget it for all time. Creo-pine sub-flooring never needs repairing.

Write today for full information about Creo-pine sub-flooring. We are able to quote very reasonable prices.

Southern Wood Preserving Co.

ATLANTA, GA.

CHARLOTTE - NEW YORK - PHILADELPHIA - PITTSBURGH - BUFFALO - CLEVELAND - TOLEDO

Southern Wood Preserving Co., Atlanta, Ga.

Gentlemen:

Please send me without obligation full information about Creo-pine sub-flooring.

Name .....

Title .....

Address .....

C-4

The Sliver Lap Machine.

Editor Cotton:

It has been some time since the appearance in the "How Other Men Manage" Department of my string of articles on the elimination of troubles in yarn manufacture. But with the indulgence of the readers, and an apology for the delay, I will attempt to forward a continuation of this discussion.

Taking up again the sliver lap machine troubles, I want to say that this machine is a source of annoyance to most mills using it, especially where long fiber cotton is used. The general trouble is in roll setting and roll weighting. Usually there are twenty ends of card sliver placed at the back of this sliver lap machine and guided over a table by a series of hooks or through holes drilled in a plate that are opposite a channeled sliver guide. In either case the result is to bring the twenty slivers up in uniform condition and present them in a sheet, so to speak, side by side—not overlapping—and guide them into the rolls.

Now right here is where trouble can be eliminated or not, as the man in charge wishes, for these rolls certainly can chew the sliver to pieces or can be made to produce a beautiful result, at will.

We will first consider the setting of the leather rolls, if such be used. The front roll (that is, the roll directly behind the smooth 5-inch calender roll) must be adjusted parallel with this 5-inch roll by a gauge, at the same time care should be exercised to determine the exact position (by thickness of gauge used) best adapted for this roll that will allow the gears to be adjusted properly. See to it that the stands holding this roll are fitted to the slide upon which they rest. This is to assure an easy running roll, not binding in any way and perfectly level and parallel with the 5-inch roll.

This gives a base to adjust from. Now my experience has always been that this first process of roll drawing gives one the basic idea of all roll setting—to get away from bulk between rolls. This bulk of cotton sliver is best handled at this machine by next placing the back roll as far toward the back of the machine or the stand slides as possible, and see to it that the stands holding this roll are level and that the roll is perfectly parallel with the front roll. Disregard the distance—distance is nothing in this case.

Next adjust the middle roll slightly closer to the front roll than to the back; or in other words, leave as much space between the middle and back roll as possible. If after these adjustments are perfected and the rolls are weighted, it is found by placing the end of a rule upon the sliver between the rolls, that this sliver gives way easily, it is certain the sliver bulk is being taken care of properly. But if there is a tension or stiffness under pressure, find some way to gain more space between these rolls.

If metallic rolls are used the distance between them should be at least 5/16 inch *more* than between the leather rolls, to allow for the bite of the flutes. Get everything parallel, level, and far enough apart for easy pressure between these drawing rolls, for if this is not accomplished, the result will be a very uneven web. There will be what I term flakes in the web, and it is impossible to draw an even sliver on a ribbon lap machine with flaky laps going in at the back of it.

Again, great care should be taken in getting the correct tension between the front steel roll and the back 5-inch calender roll. There is a great danger lurking there, for if the web is pulled apart but an eighth of an inch at this point the mill will soon be full of weak yarn that can never be remedied.

This tension is taken care of by the compensating gear among the gears that drive the drawing rolls. In a great many mills careful examination will disclose specially built weights attached to the large weights, also gears, and, in fact, most anything that has any weight about itself, may be seen hanging on somewhere about these rolls in order that the rolls may so grip the sliver that a good web may be drawn. There is where another disaster happens, for if the rolls are set far enough apart to allow for the bulk to be drawn there will be no need for extra weight upon the weights already provided on the machines.

If metallic rolls are used, the rolls should be spread far enough apart to allow the collar on the ends to run directly together. One cannot be too careful with adjustments and leverage at this process of yarn manufacture, for if there is anything neglected here it surely shows somewhere in the line of processes and a great many times to our sorrow.

Speed is another factor for consideration here. Never allow this machine to run at any speed other than at 25 per cent faster than the exact speed required to produce the exact quantity required to run its allotment of combers (8-6 head or 6-8 head combers). Adjust the rack to make certain of a good lap. Keep the friction shoe in good condition so that the rack will spring easily and form a good lap.

A. B. C. (R. I.)

Some Suggestions on Drafts.

Editor Cotton:

In considering the question of draft on roving frames, "J. D. (Maine)," who asks some questions in this connection in the February issue, should bear in mind that it is a fairly well recognized fact that lower drafts give a better quality, that as we tend toward higher drafts the quality of the work deteriorates, that lower drafts are more expensive but that this expense may be offset by the quality produced. The same holds true for doublings, as omitting frames or spinning from single roving.

The finer the yarn and the higher the number as regards quality the more roving operations we use and the lower drafts, as far as possible, using double roving in spinning. The use to which the yarn is to be put determines to a great extent the question of drafts and doublings. Do not Cotton's readers agree with this? The use to which the yarn is to be put governs to a great extent the grade and staple of cotton used.

Here are a range of drafts for three roving operations and spinning that may be considered suitable for average conditions: Slubber, 3 to 5 (average 4); intermediate, 4 to 6 (average 5); roving, 5 to 7 (average 6); spinning, 8 to 12 (average 10).

The question of proper drafts is often limited by machinery so as to secure sufficient production at one operation to balance that of another.

For "J. D.'s" draft lay-out for spinning 16s, 18s and 20s from double roving, I would suggest the following:

COTTON BLEACHERS!

Your requirements are:
Strength and Durability,
Softness and Elasticity,
A Permanent White,
Saving Weight and Yardage,
Fool-proofness,
Low Cost,
Absence of Poison-gases.

You do not get them all
unless you bleach with
the Solozone Process.

The Roessler & Hasslacher Chemical Co.
709 Sixth Ave., New York

Finished drawing sliver..54 grains	.154 hank		
Slubber	.60 hank	Draft	3.89
Intermediate	1.40 hank	Draft	4.66
Roving	4.00 hank	Draft	5.71

From this roving I would spin the numbers given by altering the draft in spinning as follows: for 16s yarn, draft of 8; for 18s yarn, draft of 9; for 20s yarn, draft of 10.

For spinning the same numbers from the same finished drawing sliver, with no fine frames and single roving in spinning, I would suggest:

Finished draw'g sliver..54 grains	.154 hank		
Slubber	.70 hank	Draft	4.54
Intermediate	2.00 hank	Draft	5.71
Spinning—single roving	16s	Draft	8.00
	18s	Draft	9.00
	20s	Draft	10.00

In the first lay-out, it will be noted, short drafts throughout are suggested. In the second, drafts are increased at the slubber and intermediate to compensate for omitting the fine frames. Spinning drafts are unchanged.

As a rule when a mill is running numbers as coarse as these, quality is not such a requisite as in the case of the finer yarn, and two roving operations would be sufficient. "J. D." limits the range of drafts possible when he specifies the weight of the drawing sliver and the number to be spun. I believe that drafts on roving frames should be progressive, as shown.

I should be very glad to see "J. D.'s" opinion in Cotton.

Bert (R. I.)

Editor Cotton:

The opinions asked by "J. D. (Maine)" for drafts on card room machinery should present much information of interest to the readers. For the first part of his question, I will suggest the following drafts and weights, using his 54-grain finished drawing sliver:

54 grains—.154 hank sliver.

.154 hank up at slubber, draft of 3, doubling 1.

.462 hank up at intermediate, draft of 5, doubling 2.

1.155 hank up at jack, draft of 6.5, doubling 2.

3.75 hank up at spinning frame, draft of 8.5, doubling 2 = 15.95s yarn. For his 18s and 20s, change only the draft at the spinning frame, making the draft 9.6 for 18s and 10.7 for the 20s.

I think it is most economical to use the same drafts and weights where there is such a small variation in numbers. It surely avoids getting roving mixed by this method.

The second part of the question—that is, making 16s, 18s and 20s yarn with a 54-grain sliver at the back of the slubber and doubling only at the intermediate and omitting the jack frame, presents difficulties the average carder would want to avoid.

.54 grains, .154 hank, therefore,

.154 hank at back of slubber, draft of 4.25, doubling 1,

.652 hank at back of intermediate, draft of 6.25, doubling 2,

2.04 hank at back of spinning frame, draft of 7.82, doubling 1, gives us 15.95s yarn. Using a draft of 8.75 on spinning for 18s and 9.75 for 20s.

These drafts are too large for single roving and as it is apparent that quality is of secondary consideration I would suggest that "J. D." omit all doublings and keep his drafts more in line with the following:

.154 hank at slubber, draft of 4.

.616 hank at intermediate, draft of 4.5.
2.772 hank at spinning frame, draft of 5.8 gives us 16s yarn.

Using draft of 6.5 on spinning frame for 18s, and 7.25 for 20s. Christy (Mass.)

Will Card Flats Fly Off?

Editor Cotton:

I have just read the second letter of "W. V. J. (N. C.)" in the December issue, and it does not surprise me at all. There is obviously some misunderstanding between us, and from his letter he is interested, to say the least.

He fully describes the cutting of a taper, but if he will read my letter again he will see that the argument is not on the first taper, but on the tail-end taper. He came back pretty strong, to my idea, when he says that when he reads articles in Cotton he reads to acquire something to improve his knowledge. That is just what I read them for.

I haven't got 400 cards, nor first or second prize in clothing cards to show my ability, but sometimes a dark horse looms up and gives quite a surprise.

Do I know that the best clothing makers guarantee fillets at 40 pounds pressure to the rib? Well, I sure do; it was one of the first things I learned, and I haven't forgotten it, either.

I hope "W. V. J." has my letter in the October number handy and will read it over again to see what I said about flats flying off. I was not clothing cylinders at the time. I was simply setting flats and telling about what kind of grinders we run across nowadays. I wrote what the grinder told me in his own words. He was setting flats to a 10 gauge and I could feel no friction at all; when set that way, it is my idea that carding cannot be done as it should be done, the fibers are just taken forward from the licker-in to the doffer with no action taken on them by the flats. If the flats are set close the fibers will be straightened out and some combing or carding will be done by the flats. Now, as a matter of fact, if flats are set too close to the cylinder, will the flats fly off, as the grinder said they would? No, and no grinder who is a real grinder will say so, either. The result will be that the teeth of the flats and those of the cylinder clothing will interlock and the card will stop, or, as we say, it will get stuck. No doubt the fillet will rise and some damage will be done to the flats, but the flats will not fly off. If I am not right, will "W. V. J." show me wherein I am wrong, so I can stop instructing my grinders to that effect. For I want good grinders and good grinding, and I do not want to teach them anything that is not correct.

If "W. V. J." will read my letter in October Cotton again he will find that he need not have gone to all the trouble of designing a taper, for that is not the argument. The last paragraph of his first letter in the August issue reads, "Card fillets vary in width under pressure and should be measured before commencing to pull the wire with an allowance of ⅛ inch for exposed cylinder to avoid fillet expansion rubbing the arches." That's very well; there cannot be argument there, but he continues, "At this point the wire must be pulled from the outside or right hand side of the fillet and cut tapering every 18 inches until the fourth rib has been pulled and shoulder made fast by tacking." That's where my argument is. He can't make that tail-end taper by cutting tapering at every 18 inches. He states at the beginning of the paragraph that card fillet varies in width under pressure, and in his letter in the December issue he contradicts his tapering of every 18 inches and says in the next to the last paragraph that when the cylinder is carefully measured so as to take 12 ribs and allowing ⅛ inch for selvages, the first row of wire is removed about 12 or 15 inches on the right hand side of the first rib, then drop off three inches, and pull wire from the second row and drop off three inches and pull wire from the third row. This removes the entire rib as far as the man cares to pull the wire. Then the cylinder is moved until a point on the cylinder is located ¼ inch or a rib narrower than the first measurement, the wire is pulled as on the first cut. Here he states until a point has been reached, but does not say if it is 15, 18 or 20 inches. In his first letter he said, "every 18 inches."

Again, he says he never broke but one tail end. Well, I have, and more, I have broken doffer fillet right in the middle of the doffer. E. A. G. (N. H.)

A Correction.

Editor Cotton:

Received February Cotton today and about the first thing I noticed, in my article beginning on page 413, was the "gigantic" size of the old-fashioned mill warper. The statement reads, "Warps made on the old-fashioned mill warper, which was a vertical reel with a diameter of from 22 to 24 yards. . ." This should have read, "Warps made on the old-fashioned mill warper, which was a vertical reel with a *circumference* of from 22 to 24 yards. . ." In the drying of the chain warp it is the outer surface that drys first.

Please make this correction in Cotton. Sorry I made such a blunder. J. J. B. (Conn.)

The Discussion on Fly Frames.

Editor Cotton:

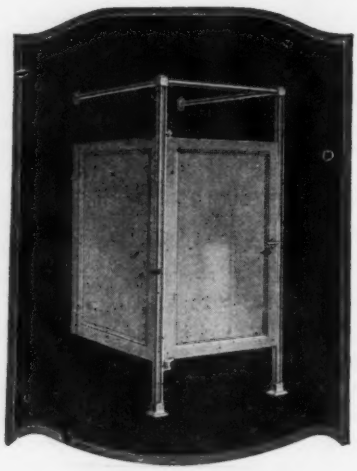
In his article, entitled "A Little Talk on Fly Frames," in the July issue, "K. C. (Conn.)" starts his first paragraph by stating that in my discussion I came back pretty strong at "K. S." and himself, and continues, "it would seem that nearly everything we have said is, in his estimation, wrong."

Well, let's see what they have said. Look up the December issue of Cotton and find the article entitled "Mechanical Laws and Machine Design," written by "K. S." Read the 11th and 12th paragraphs. Next look up the February issue and read paragraphs 18, 19 and 20 in my article, entitled "'Wash' Discusses Fly Frames and Differentials." Then read paragraphs 13, 14 and 15 of "K. C.'s" most recent article, and wonder why he is not convinced, after my giving the figures and outline that a different flyer and pressure will cause.

In his December article, in the 6th paragraph, "K. S." says that "Wash" is altogether right when he says that a higher frame speed will make a firmer bobbin.

One of our friends is wrong.

Why not do as I do—take each paragraph of my articles and answer every statement made therein? "K. C.," in the second paragraph of his article, claims I omitted one of



Now!

A Still Better Sanymetal

An Entirely New Design, with these Exclusive Features:

Brand new interlocking construction, which means actual rigidity, no rattles, no banging doors.

A perfect wall-fit — a perfect floor-fit.

Paneled posts. Drawn metal trim on both doors and partitions.

Encased Sanymetal Gravity Roller Hinges—springless.

Finest polished aluminum hardware and base shoes.

All metal edges, bolts, screws, etc., concealed.

Beauty
Sanitation
Durability

Get Bulletin No. 9

THE SANYMETAL PRODUCTS CO.
986 E. 64th Street Cleveland, Ohio

Sanymetal
TRADE MARK U.S. REG.
Toilet and Office Partitions

Is It Worth While?

Is it worth while to buy cheap oil and risk costly frictional wear on good machinery? The best is cheapest all around.

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

Modern Textile Lubricants

Best Lubricant—because it gives most dependable and consistent lubricant protection.

Best for Economy—because it costs less per month for lubricant (it lasts so much longer than wasteful oil) to say nothing of saving in machinery repairs and replacement.

Best for Profit—because it stays in the bearing and off the product—and your goods are undamaged.

NON-FLUID OIL has proved best by test for over 70% of leading mills. Will you make this test for yourself? We furnish free sample and bulletin "Lubrication of Textile Machinery."

New York & New Jersey Lubricant Company

401 Broadway New York

Southern Agent
L. W. Thomason, Charlotte, N. C.

Ample Stocks at our Branches:

Charlotte, N. C.
Greenville, S. C.
Atlanta, Ga.
New Orleans, La.
Chicago, Ill.
St. Louis, Mo.

N. Y. & N. J. Lubricant Co.

Please send Testing Samples and Bulletin on "Lubrication of Textile Machinery" to

Name .....

Address .....

C-4-24

his questions, which is, "Why is it, if the roving is strained on all bobbin-lead frames, as he says it is, that if an operator stops a speeder and removes a little singling which makes the bobbin of roving a trifle smaller in diameter, that the end will slack down every time that the traverse gets to where the single roving was removed, and many times the end will have to be broken back until another set is started? Isn't this pretty good proof that we are not pulling the roving all to pieces on the bobbin-lead frame?"

Let's examine the foregoing statement carefully. "K. C." says "the end will slack down every time that the traverse gets to where the single roving was removed;" then he means only a portion of a layer. So if "K. C." is right, his tenders are obliged to break back every end that lacks a layer.

But let's see, did I say the roving was strained on all bobbin-lead frames? In the January issue of COTTON, on page 225, "S. A. F." states, "Isn't there always a certain 'drag' or tension or 'draft' or whatever you may call it, between the front roll and the bobbin?"

In the September issue, in my article on "Bobbin-Lead Versus Flyer-Lead," in the sixth paragraph, I say, "A bobbin-lead frame will make excellent work when the average length of the staple used exceeds the distance from the point of pressure on the surface of the bobbin to the first wrap on the presser finger." The reason why is shown in the eighth paragraph of the same article.

If our friends will get this pointer they will learn why a flyer-lead frame will run a lower grade of stock to better advantage than a bobbin lead.

In the fourth paragraph of his July letter, "K. C." seems tickled to death, for he firmly believes that "B. A. B." has given the flyer-lead frame a black eye. Since my first letter to COTTON in 1913, I think I have answered the two questions he brings up there about 999 times. However, I am glad they dropped the hesitation of the bottom cone.

The first defect, as pointed out by them, is that the bottom cone has its slowest speed when the bobbins are empty, and its greatest speed when full or filled. The bottom cone constantly and uniformly increasing the number of revolutions per minute between these two extremes.

I hope "K. C." and "B. A. B." will read the following a few times and get the right dope on this point.

On the bobbin-lead frame, the number of inches of roving delivered by the drawing rolls must be drawn past the pressure under the presser pad and the bobbin must lead the flyer correspondingly, which makes the speed of the bobbin exceed that of the spindle during winding. The cone belt is called on to drive this excess speed and receives no aid from any source, which is proven by the fact that in order to wind-on, whether the frame is running or stopped, the bottom cone must be made to rotate in the direction to wind-on.

On the flyer-lead frame, the flyer must lead the bobbin correspondingly for every inch of roving delivered by the drawing rolls. Owing to the direction of the presser finger, the pressure is less on the flyer-lead. But the greater the pressure, the better, for the reason that the flyer rotates around the bobbin and has the tendency of taking the bobbin around with it.

That is why you need no special cone belting on the flyer-lead. At no time during winding does the speed of the bobbin equal that of the spindle.

Taking up their second named defect, that the flyers start in advance of the bobbin, and by so doing, make a weak place in the roving. But how in the world can any winding take place if the flyer does not lead? "K. C." and "B. A. B." do not stop to consider that the bottom cone takes revolutions from the bobbins. Raise the bottom cone and it will be found that the flyer does not start in advance of the bobbin. In order to strain the roving on a flyer-lead frame, the rack must be wound toward the small end of the bottom cone to increase its speed. The faster the bottom cone revolves, the more revolutions are taken from the bobbins, and you have stretched work.

But the same results will be gotten on the bobbin-lead if the rack is shifted toward the small end of the bottom cone. Conditions are the same. The trouble is, most mill men must learn this dope. The very fact that when you raise the bottom cone it increases the speed of the bobbin to that of the spindle, should be proof enough that it is impossible to strain the roving, unless the tension is too tight as in the case of the bobbin-lead.

If "K. C.," after reading this explanation, still considers these two points as bad defects, I hope he will let the readers know why he thinks so, explaining himself as I do.

You know, a great many mill men think that the bobbin starts in advance of the flyer—it does if you don't raise the bottom cone.

What "K. C." says in paragraphs 6, 7 and 8 is to my mind all twaddle; it was his claim, not mine.

In the ninth paragraph he makes a break. "Wash" stated that the cone belt drives the excess speed and that the tight gear on the jack shaft is no aid. Listen! This gear on the jack shaft has a constant speed, so try to figure out how it can help another speed that changes at every layer. It's impossible. I've said all along that "K. C." has the wrong dope. I wonder if he has "Cotton Mill Machinery Calculations"? He needs them when he says that "Every carder must know that this tight compound gear turns the bobbin gears at a reduced speed when the cone is **still.**"

He's wrong again. When the bottom cone is still you have an equal speed, not a reduced speed.

Again, in the ninth paragraph, he says, "Now, how is it that it has nothing to do with driving the bobbins when the cone is running?" "K. C." should not forget that the driving belt drives this gear in question, and whether the bottom cone runs or stops, this gear keeps right on its job of running the bobbins at a speed equal to that of the spindle. So when you want extra or excess speed, you must get it from the bottom cone.

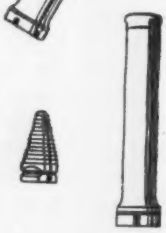
He displays more wisdom in the tenth paragraph, saying, "If some of the ends are stretched, why not all of them?" Yes, and if a dry roll causes enough friction to reduce the diameter of the bobbin, why not all of them? What's the difference?

The ends are supposed to be running at the same tension, but we find only a few do. The day of having even tension on fly frames is a long way off, but a change in system would make a great improvement. I know, for I made the test years ago.

I would not care to run a mill with the mixed stock "K. C." talks about in paragraph 11. If my bobbins varied ⅛ of an inch in diameter, I would get new bobbins or a new job.

JORDAN
MANUFACTURING COMPANY

Good Timber
Careful Workmanship
Prompt Service



BOBBIN
MILLS

Monticello, Ga. Toecane, N. C.

GARLAND

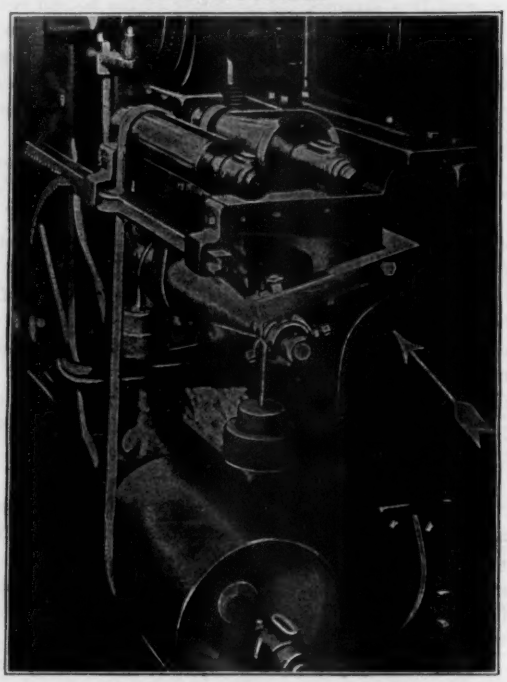
Have You Noticed the SOLID LOOPS in "Garland" Loom Harnesses?

The loops of our loom harnesses are filled with varnish, every one, and are as solid as the best varnish can make them. This prevents the eyes from working loose and breaking the warp threads which mean better weaving and more of it.

TRADE MARK

GARLAND MFG. CO.
SACO, MAINE

CORN SWINGING IDLER CONE
for
KITSON PICKERS



BAHAN TEXTILE MACHINERY COMPANY
Greenville, S. C.

As regards that truly cone-driven speeder, I hope the boys will criticize all they can.

What "K. C." says in paragraphs 13 and 14 was answered long ago. What he says in paragraphs 15 and 16 may be true, although my Saco-Lowell catalog gives a spindle speed of 1,537. However, I'm not going to argue against this speeder, for it's my favorite frame.

Answering his questions in paragraph 19: (1) Get some new bobbins; (2) make the work even so as not to vary more than 1/10th of a hank, which is possible by correct speeds, drafts and settings in the preceding processes; (3) if my work varied to such an extent, I would consider myself in wrong and learn to do better.

What "K. C." points out in paragraphs 20, 21 and 22 is not very hard to overcome. Just fire the carder.

Wash (R. I.)

Textile Schools Deserve Greater Support.

Editor Cotton:

Have the southern textile colleges offered their students such courses and training as to properly equip them for successful careers in the mill business? There seems to now exist quite an amount of contention that the college man has failed in the industry and varied opinions are held both in regard to the relative merits of the southern colleges offering textile courses and to the hundreds of men who have graduated therefrom.

Many are attesting that few college men have made substantial successes in the textile industry, but attribute the fact to a feeling of animosity and prejudice toward the college man by those in authority in the mills, thus depriving him of a fair chance. There is no doubt that there are many cases where the textile graduate has been overwhelmed with unfavorable circumstances solely because he is a college man and possesses the advantages in learning and culture his college course and activities have given him. His failure has often been a foregone conclusion on the part of those under whom he has worked, and unless he has possessed an unusual amount of stick-to-it-iveness, his career in the mill has been short-lived; however, this feeling among superintendents, overseers and even the rank and file of employees is on the wane, and will continue to be less evident as the many agencies such as night schools, which are placing educational advantages in easy accessibility to the mill people, grow more prevalent in and around the mill.

Others attribute the so-called failure of the college man in the textile industry to the erroneous attitude and ideas with which the graduates are imbued when entering the mill. Again, we find quite a bit of truth, for undoubtedly some of the graduates' ideas of real conditions in the cotton mill are absolutely unsound and unpractical, and there is little wonder that the mere mention of the college man provokes disgusted mirth among those who have had experience with such men. But this is not true of the graduates as a whole, nor should the institutions responsible in part for sending out such men be blamed. The textile departments of our southern colleges are weak; in fact, to such an extent that it would prove distasteful to make comparisons with other courses the colleges offer. After studying our textile educational institutions we would hardly realize that it is their mission to train men for a work which is really the backbone of southern industry; one unfamiliar with conditions would naturally expect to find these institutions equipped with the most adequate machinery with which most efficient and practical instructors could teach and train the young men of the South in modern mill practices. The textile courses should rate second to none of the technical courses offered, for the industry which it represents already ranks supreme in the South and all indications seem to predict that the South is to assume the textile supremacy of the United States.

The southern mill people must face the inevitable fact that if the textile educational institutions are to serve the industry through their graduates and the experimental work that such institutions should conduct, the mills must adequately support them, for without proper support and close cooperation the usefulness of the college graduate and the institutions they represent will continue to be limited. The students following the textile courses may possess the most ideal traits; the colleges may have inculcated in their aims the highest ideals, and the professors may be untiring in their efforts, but unless those actually manufacturing textile products keep in close touch with the colleges and lend their support to them, no definite and substantial results can be expected. It is doubtful if one can contend that the textile departments in colleges have received very much support of any kind from the textile interests of the South, for not only have the southern mills as a whole failed to encourage and support the textile departments, but some have discouraged the work of the colleges and the graduates by their entire lack of interest and refusal to recognize the benefits that can be derived from the institutions. Some of these mills are vitally interested in the development of their employees and spend thousands of dollars annually toward making their villages more attractive, yet they seem to lose sight of that most important fact that in order to meet the future and the intricate problems of labor and machinery which will confront the industry, the mill work itself must become elevated and dignified to the same extent the employees have and are becoming dignified and developed. The entire plane of life of the mill operative has been raised, the mode of living is much higher and his work within the mill will seek the same level for it is a natural course of events and the textile colleges can become a strong factor in this development.

In the past neither the faculty nor the students have had access to the mills. Some few interested plants have kept in touch with the colleges and have rendered wonderful service to the handicapped departments, but as a whole the textile schools have been unrelated to the industry which they represent and of which they should be an integral part. Few mill men ever appear before the students, nor are the students given many opportunities of seeing the mills or of knowing what mill men are doing or thinking. There is no wonder that a true understanding of mill people and their ideas is not possessed by the textile graduate. He in reality enters an entirely new field and it is quite natural that he makes many mistakes while in the process of disillusioning himself and in acclimating himself to a practical life with a practical people—so, as stated before, unless he possesses an unusual amount of patience and perseverance, his mill career is speedily ended.

It is very evident today that the old type of cotton mill management and control is going through a process of

KNOXALL

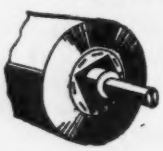
ALL WOOL ROLLER CLOTH

Makes better yarn, less waste and saves in leather more than the extra cost.

EDWARD H. BEST & CO., Inc.

BOSTON, MASSACHUSETTS

A Worth While Saving!

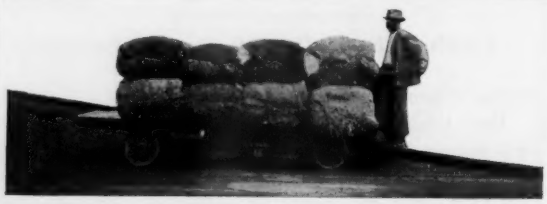


On any LOG Roll we will give a good allowance when using old fittings—no matter what size or style of roll.

Remember this saving the next time you need a log roll—and write to

RODNEY HUNT MACHINE CO.

47 MAPLE ST. Roll Department ORANGE, MASS.



ELWELL-PARKER TRUCTORS

used in

OVER 200 BRANCHES OF INDUSTRY

Thousands of dollars are saved annually at small initial cost by owners of Elwell-Parker Electric Industrial Trucks, Tractors and Cranes. They pay for themselves.

Let us advise you in reducing your time and labor in handling cases, bales and chemicals in mill and warehouse.

Catalog 130-C upon request.

The Elwell-Parker Electric Co., Cleveland, Ohio

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks.

Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.

99 Beekman Street NEW YORK

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES

have been added to the "1912" Cloth Cutting, Folding and Winding Machine which **add at least 50 per cent to its value to YOU.**

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two and you get an extra strip from each bolt of cloth.

It cuts the corners of expenses in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

ALL STEEL **ECONOMY** FIRE PROOF **BALING PRESSES**

ALL SIZES FOR ALL PURPOSES

LARGEST LINE BUILT IN U.S.A.

ECONOMY BALER CO., DEPT. C, ANN ARBOR, MICH., U. S. A.

changing and the changes entail the placing of authority and leadership in the hands of broadened and trained men, men whose activity and leadership is governed by solid foresight rather than by the rear-sight of haphazard experience. The industry is moving forward and it seems but wise that systematic method of developing men to captain the industry should be encouraged and supported. The textile departments in the state colleges offer the ideal method, provided the industry cooperates. Without this cooperation little can be accomplished. With it students can keep abreast with what is actually taking place in the industry itself; they can be familiar with new developments in machinery and processes and can train themselves in the modern methods and systems rather than those presented by a text many years old. They can then enter the textile business ready to take their practical experience in a substantial and understanding manner and be prepared to later assume leadership for which they will have become equipped. M. W. H. (N. C.)

Measuring Roll Settings.

Editor Cotton:

As to the best method of measuring the settings of rolls, asked by "M. R. K. (Ga.)," the best and most accurate way is to take a piece of white paper and lay it on the steel rolls, then take a piece of carbon paper and lay on top of the white paper, weight the rolls on these, let stand for a while or press down a little. This will mark the paper, and then the distance between the marks is the correct distance from bite to bite. I have found this is the most convenient and the most accurate method.

Now as to setting the rolls: I always draw a line from one end of the frame to the other, tieing each end on the outside of the bearing boxes and then set my back rolls to this line, and then use a leaf gauge, known as a roll gauge, which is about three inches long and one-half inch wide, and one-eighth inch in thickness. To the leaf of this gauge I set the middle roll, setting between the bearing boxes. In this way I get a correct setting. In setting between the bearing boxes I always clean them good.

J. F. C. (R. I.)

Editor Cotton:

Answering "M. R. K." as to how rolls should be set, I would like to submit the following:

In the first place we have a leaf gauge made up of 1/16-inch ground stock, one inch wide and 2½ inches long, containing 16 leaves. We measure the outside diameter of the first and second rolls—using, for example, a front roll 1⅜ inches in diameter and a second roll 1¼ inches in diameter and a third roll 1¼ inches in diameter. If the first two rolls were put together they would measure 2⅝ inches over all, and one half this distance would be 1 5/16 inches which is the distance between the roll centers. Then, if we want a setting of say 1 7/16 inches between centers of the first and second rolls, we simply set up the rolls with two leaves of the gauge and the leaves being 1/16 inch thick each, would add 2/16 inch to the distance between the roll centers and thus give the setting desired.

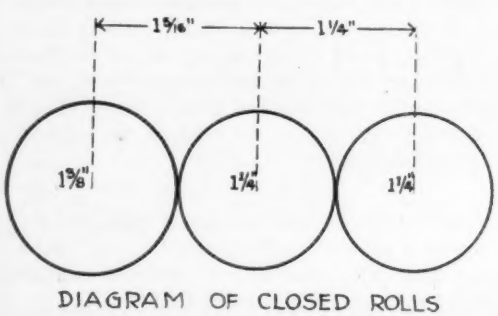


DIAGRAM OF CLOSED ROLLS

I have set rolls in various other ways but I have never used a method which I think is as accurate as this.

M. C. F. (Mass.)

Reasons for the Decrease in Mules.

Editor Cotton:

Why are mules and mule-spinning becoming obsolete, or almost, in this country, and why is it they are more successful in England with this method of making yarn than we are in the United States?

There are many answers to this question propounded by "J. R." in the February number, and they are diversified and numerous. I will try to give a few of these answers.

The ring frame costs less per spindle to purchase. The production is higher. Therefore the cost per pound is less. Only semi-skilled operatives are required to operate them. The cost of replacement of broken parts is less. Also less breakdowns occur owing to the simplicity of the frame. Lack of interest of executives owing to the complexity of the mule.

These are only a few but there are two more which I think have had a still greater effect in supplanting the mule: High speed of looms, which causes a rougher handling of mule filling thus causing a large increase of waste at the loom. The system as employed in England is far superior for quality and production to the system we have. Had we employed the same system as is the English custom I think the life of the mule here might have been lengthened. Here we have one man to a pair of mules with back boys helping on two pairs. In England there are three and sometimes four spinners to a pair of mules. Their wages are divided while here the mule spinner has demanded and received all that came off the mule. So, in condensed form, we can say that the simpler machine, the easier operation and lower costs are the primary reasons why mule spinning has had its day. One more word: We must not forget the fact that England today has ten million ring spindles and that mule spindles are constantly being replaced by ring spindles, proving, to my mind, that we are on the right path by installing the ring in the place of the mule. Christy (Mass.)

"Formula of Facts, Figures and Facilities for Finding Faulty Figures in Production Costs" is a treatise issued by The Root Company, Bristol, Conn., manufacturers of automatic counters. It deals with the counting of everything from a needle to a human—from revolution to picks and hanks in a textile mill. A copy will be sent to those interested.

Little Things in the Spinning Room.

EDITOR COTTON:

How many overseers of spinning study the roving from the card room to see whether the bobbin runs best at full, half-full, two-thirds full, or one-quarter full? It's a very peculiar thing to study. At first there doesn't seem to be much to it, but when you think of the possibility of the roving being stretched through its course of filling up, and of tight tensions, there is considerable room for thought, for the fly frames, be they operating ever so good, can run through a tight tension period and not be noticed by the operative or by the section foreman in charge of the section of roving frames.

So it is up to the overseer of spinning to help locate such weak places in the roving, if there are any, and there generally are, even from the best of card rooms. An overseer can get his room up to a high state of efficiency, where everything is in tip top shape, and yet he has more at stake than he had when his room was in bad condition, because he has not much to gain and a lot to lose. It's easier at this period to locate those small things and have them remedied than to wait until they become larger ones. Also, when an overseer gets a room up to a high state of efficiency, he can point out those small things without contradiction, and receive much more hearty support from the carder.

For several weeks I noticed that of the ends down in the spinning room, the roving was mostly from two or three layers on the bobbins to one-third or half-full, which shows that there is an extra stretch in the roving at this period of winding on the roving frame. We at once called the carder's attention to this and had him come around and see it for himself. Seeing this, and the fact that the spinning was running well with this exception, he had no other recourse than to try to get by the point that the spinner was trying to show him, and so had to give in and go back to his department and get busy.

We have a very good system for keeping the spinning room up, overhauling being done all the time and as we have about 200 spinning frames and it keeps two men busy doing the changing, such as changing from one number of yarn to another, changing draft gears as the weights go off, as happens in all cotton manufacturing plants, etc. We have to change according to weather and according to the weights that the finisher picker man lets go by. Some will average better than others, some weigh all on the heavy side while at another time another man will weigh and allow all laps to go on the light side; this, in connection with the cotton going off on grade at times, necessitates changing the draft gears in the spinning room, especially on the filling.

After a thorough investigation the carder found that some frames ran too tight from the start, and the tenders had to let off on the tension until the frame got well on its way. Now, he had thought he had all the frames set so that the help never had to monkey with the tension. This had been getting by him, as it was easier for them to let off a little on the tensions than to hunt up the section foreman and let him do it. This was only caused by the first setting of the cone belt guides on the cone belts, and after carefully adjusting these, one by one, the work is beginning to show up better. But we have never stopped our investigation, and never will, for when we get this one fixed as best we can, we will locate another weak point and go after it.

Our system of looking after top rollers is to take a few frames each week, so that the section man can get over his section of frames each month. We have the oiling of the spindles done in the same manner, so many frames each week. The overhauling squad is scheduled to go around once a year and straighten all bent spindles and put them true. We have the adjustable guides which are easy to set and we are not so uneasy about their getting out of the way under ordinary conditions.

This letter is mostly to show that when the spinner has his room in what he thinks is tiptop shape, he has an equal reason, if not more, to be on the alert. When weak points show they are like a snake, and are likely to pop up in any direction, for the surroundings are going to get foul if he doesn't keep the little things cleaned up. Once make a hiding place for the little ones, and some sweet day he will wake up and be stung from more angles than one. Snake medicine is rather a scarce article these days, and he might not find a doctor handy to take care of the bites, so it's best to be hunting something all the time, and keep well.

T. A. D. (Ga.)

A. A. Underwood has become manager of the reel and beam department of the Frank Mossberg Company, Attleboro, Mass. For the five years previous to 1914, Mr. Underwood was with the Worcester Pressed Steel Co., estimating and selling pressed steel stampings to the automobile industry, electrical equipments industry, etc. In 1914 he became associated with the Frank Mossberg Company to handle a similar line to that he handled at the Worcester Pressed Steel Corporation, namely, pressed metal stampings. The Frank Mossberg Company were at that time making pressed steel beams for narrow fabric mills, such as the elastic and non-elastic webbing mills and silk ribbon mills. Through the cooperation of several of the mill superintendents in Fall River, New Bedford and surrounding textile centers, Mr. Underwood investigated the field for pressed steel loom and section beam heads in the mills. Up to that time they were using wood or cast iron heads, the cast iron heads, of course, predominating. He was successful in developing a satisfactory pressed steel head and one that met with immediate approval by the mill men. Since that time Mr. Underwood has been working to develop steel loom and section beam heads to such an extent that they will satisfy all the requirements of the mills.

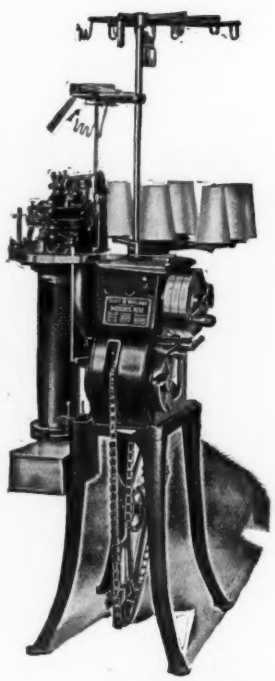
In the fall of 1919 Mr. Underwood left the Frank Mossberg Company to help organize the Mossberg Pressed Steel Corporation, and was with this company until March 1st, 1924, when he returned to the Frank Mossberg Company. In his present position he has charge not only of the sales of this product but also designing, construction, etc. His intimate contact with the field over so many years gives him a broad viewpoint on the needs of the industry and how to satisfy them.

Newport Chemical Works, Inc., has announced the production of a dyestuff identical with the one listed under Schultz 326. This color will be marketed commercially under the name of Newport Diazo Fast Blue O.

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.

Automatic transfer from ribbed stitch to plain.

Eliminating necessity of skilled help.

Saving of raveling waste which occurs when topped by hand.

Each stocking is dropped from the machine when finished.

Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Needles without rivets or latches.

Speed of machine about the same as Model K.

Production about twelve stockings per hour on 3¾″ 220 needles.

One operator can take care of the same number of machines as Model K.

The machine is built in all gauges.

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

High Point, N. C.
401 Wachovia Building

What It Takes To Make "Quissett Quality"

We are often asked how we secure and maintain the high standard of quality in Quissett Quality Yarns. There are many answers to this question, and the main answer is found in a combination of many answers.

The many reasons could not be enumerated in this one page, but first, of course, we use only carefully selected early bloom cotton and the other reasons will be found in the mill itself, not in any one spot, but in every spot from the receiving room to the shipping room.

For example, there's Bill, the Overseer of Combers, who takes a personal pride in the condition of the stock that leaves his room, examining every delivery as many as four times a day and demanding that roving be uniform in thickness and free from lumps and slubs. Then, there's John, the Overseer of Picking, who insists that every lap be clean and even. These men are two reasons, and other reasons will be found in every other operative, down to the boy that sweeps the floors. These operatives enjoy life and take pride in their work. They are highly paid, are contented and they stick.

These few reasons, in combination with many others, go to make "Quissett Quality."

Carded and combed Cotton Yarns in all Numbers and Descriptions.

Ply Yarns our Specialty, Egyptians, Sea Island, Peelers, Sakelarides.

Quissett Mill

New Bedford, Mass.

Wm. M. Butler, President, Edward H. Cook, Treasurer, Thos. F. Glennon, Agent

QUISSETT MEANS QUALITY

Air Conditioning Practice in Cotton Mills

By Albert W. Thompson
Vice-President Parks-Cramer Company

(COPYRIGHT 1924 BY PARKS-CRAMER CO.)

Continuous Humidification Desirable. Every manufacturing department suffers more or less from bad conditions after a week-end in winter, if rooms become too warm and dry while shut down. In many progressive mills the heating and humidifying systems are operated under automatic control during nights, week-ends, and noon hours. The relatively slight expense is justified by greatly improved conditions.

Yarn Conditioning. Freshly spun yarn, even when manufactured under the most favorable atmospheric conditions, has a pronounced tendency to kink when unwound from the bobbin. This is due to the natural elasticity of the fibers which, as they lie in the yarn under the tension due to winding, are in a condition of stress. This stress and with it the tendency to kink, disappears with age as the fibers progressively relax and take a permanent "set." In hosiery yarns the tendency to kink is a serious obstacle to good production during the process of knitting. It is important to eliminate the kinky condition before knitting is attempted.

If the knitter relies solely upon the ageing process the yarn must lie a long while in storage, occupying considerable space and involving investment in a large quantity of material, in bobbins, trucks, and storage facilities.

The process of setting the twist to eliminate the kink can be forced by exposing the yarn to a warm moist atmosphere. Because of a softening of the waxy constituents, the fiber rapidly yields to the stresses. When again exposed to normal atmosphere the tendency to kink has disappeared. In addition, a higher moisture content has been acquired, the yarn has become softer, more pliable and greatly improved in strength and in general suitability for the process of knitting.

This process of "conditioning" is highly advantageous for hosiery yarns. In the case of the mill which sells its product to the knitter, not only is the yarn rendered more choice in quality and readily marketable, but its regain is accurately fixed.

The process consists in exposing the yarn for several hours in a room equipped for the purpose. The usual atmospheric conditions are a temperature in the neighborhood of 100 degrees F. and approximate saturation—about 95 per cent relative humidity. It is essential that there be no free moisture or fog present and a brisk circulation of air is required. If these precautions be observed there will be no tendency to rust the metallic parts of the bobbins or to mildew the yarn. Temperature undoubtedly plays an important part in setting the twist. The waxy constituents of the fiber must be sufficiently softened to permit the fibers to accommodate themselves to the stresses due to twist or tension, which are the cause of kink.

The time required for conditioning and setting will vary with the amount of twist, the tension, the fineness of the yarn, and the size, shape, and density of the package.

Control of temperature and humidity is essential in this process. Since free moisture must be eliminated the apparatus is necessarily of a rather highly specialized form.

The contrasted photographs of yarn prior to and after

Conditioned.

Unconditioned.

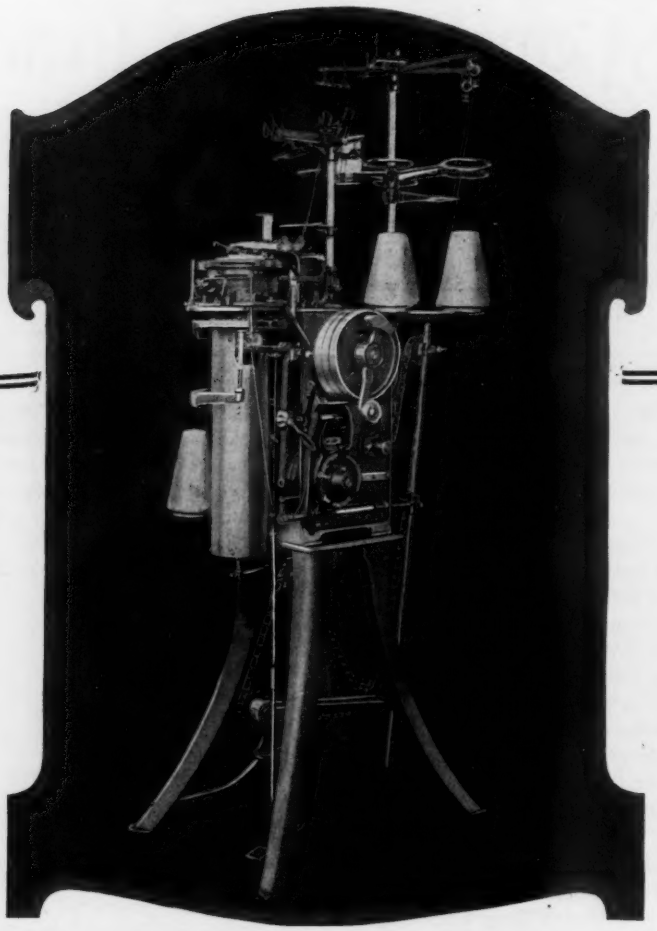
conditioning which are shown herewith give an excellent conception of the results accomplished by proper conditioning. The effective elimination of kink is especially evident. In this particular case hosiery yarn, after being conditioned for twelve hours, had gained 2½ per cent in

Conditioned.

Unconditioned.

regain. Compared with its original state these photographs indicate great improvement in its suitabilities for knitting.

Setting the Twist in Filling Yarns. Filling yarns, especially those used on automatic looms, require conditioning. Kinking of the yarn when unwinding from the bobbin in the shuttle produces serious imperfections which not only impair the quality of the product but seriously reduce production by increasing the percentage of loom stoppage. Filling yarns may be treated by the process



Wildman Spring Needle Knitter

Naturally it is your ambition to turn out better hosiery at every opportunity.

And our ambition has been, for the past 10 years, to make The Wildman Spring Needle Knitter produce finer and smoother fabric for *you*. Experience of users shows how well we have succeeded.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the Wildman Spring Needle Knitter Machine Instruction Book, giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book, "The Science of Knitting"—Price $3.00

TRADE MFG MARK

WILDMAN MFG. CO.

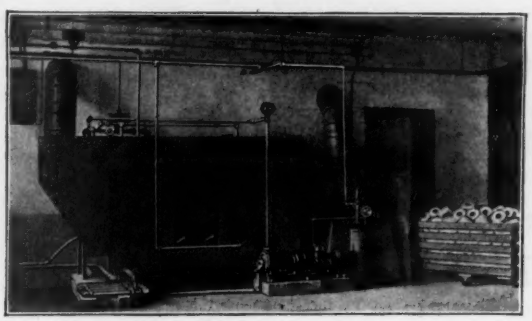
NORRISTOWN, PA.

just described if the fineness and quality of the product demand it, but in most filling yarns conditioning is possible by a continuous mechanical process.

Machines built for this purpose are provided with a wire mesh conveyor apron covered with a hood, in which a warm and supersaturated atmosphere filled with fog is created by mingling water spray from atomizers with low

Unconditioned.

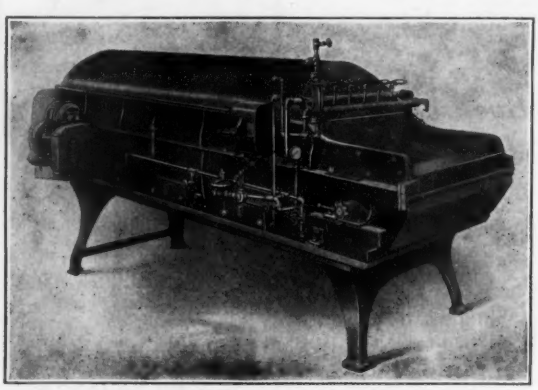
pressure steam. It is customary to provide a table back of the machine onto which the filling bobbins are discharged from a truck, where an operator spreads them upon the feed apron of the machine, selecting and culling out bobbins containing imperfect yarn. The bobbins pass through the machine at a rate of speed sufficient to give them the required exposure, and are delivered into a truck, warm, partially charged with moisture and partially cov-



Yarn Conditioning Room.

ered with deposited spray. It is customary to cover the truck when filled and after a very short interval—half an hour or less,—the yarn will prove to be dry as far as free moisture is concerned, but nevertheless so fully charged with hygroscopic moisture that the twist is properly set and in condition for immediate use in the weave room.

This process is suitable only for preparing filling yarns for weaving. It is in no sense the equivalent of the previously described process of yarn conditioning by expos-

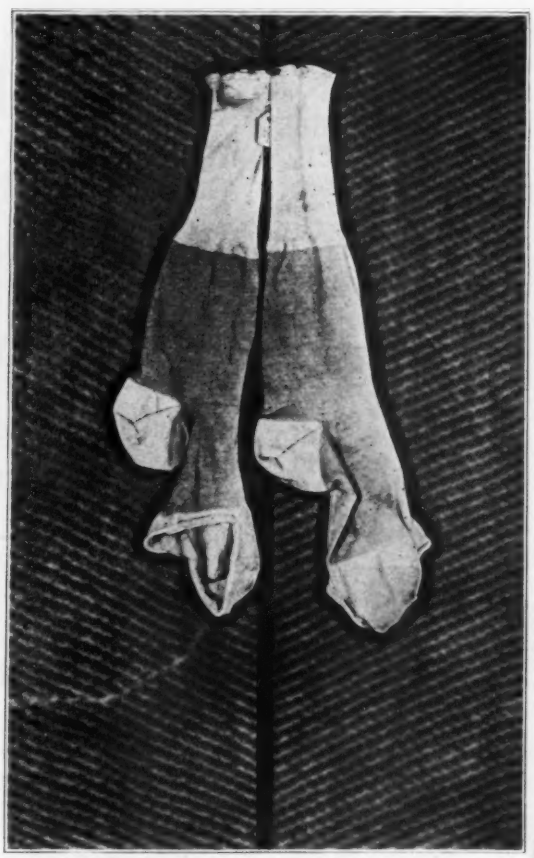


Sargent Yarn Conditioning Machine.

ure to a highly humidified atmosphere, which is the most satisfactory method for the conditioning of high grade hosiery yarns.

Knitting. In knitting, yarn is subjected to very rapid manipulation. It should be smooth, supple, and free from kinks. While not subjected to such heavy strains as in weaving, strength is important. A dry atmosphere develops static electricity which interferes with production; the yarn becomes correspondingly dry, losing in strength and tractability.

Knitting machinery of the spring needle type requires close adjustment so that the yarn shall conform to manipulation and prevent dropped stitches, pinched yarn, and other imperfections in the goods. In a dry atmosphere static electricity requires an extra-close adjustment of the



Using unconditioned yarn on the left and conditioned yarn on the right. The stockings were knit on the same machine from the same cone of yarn, conditioning being the only difference.

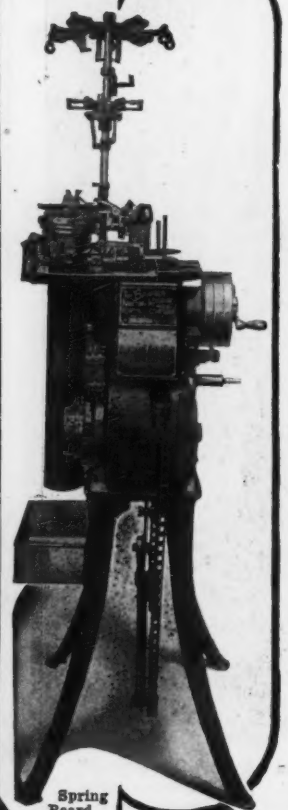
crimp of the needle. This interferes with the proper passage through the needle of trivial imperfections, results in breakdowns, defects, and serious loss of production.

With properly conditioned yarn, free from kinks and knitted under favorable atmospheric conditions, ample space in the crimp of the needle becomes possible. Operation then proceeds smoothly, with reduced breakage, a higher rate of production, and uniformly good quality.

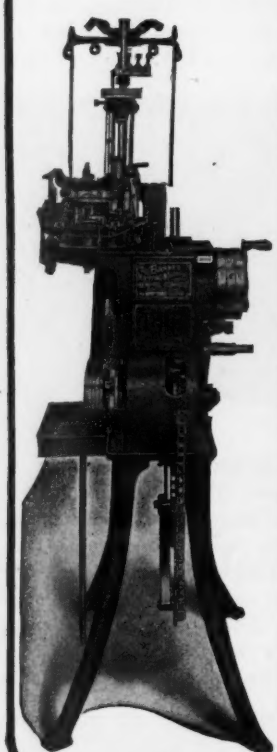
With machinery of the latch needle type, although the question of adjustment is less serious, humidification greatly improves quality and production, chiefly through the elimination of kinks and increased strength in the yarn. Humidity in winding departments eliminates static elec-

The Banner

Full Automatic Hosiery Machines



Spring Beard Needle Machine



Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model –Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BL'DG.
PHILADELPHIA, PA.

tricity, fly, and yarn breakage. It in no way interferes with, but rather benefits the proper functioning of the yarn cleaners.

The proper conditioning of hosiery yarns prior to knitting is well worth while, irrespective of humidification in the knitting room. It permanently improves the strength of the yarn and frees it from kinks. We show photographs of two stockings, one of which was knitted from unconditioned yarn. The imperfections due to frequent breakage during knitting are clearly visible. The other stocking was knitted on the same day, on the same machine, from the same cone of yarn, but was conditioned prior to knitting. The greatly improved quality reflects the direct benefit of conditioning.

Humidification during winding and knitting processes is of still further benefit. It eliminates static electricity and preserves yarn strength. The best results are secured by practicing both conditioning and humidification.

Relative humidity of at least 60 per cent is needed for knitting. In extra-fine products somewhat higher humidities will be beneficial. The best condition should be determined by thorough trial in each case. Automatic regulation ensures the best possible results by maintaining constantly the desired condition.

The knitting industry has been slow to adopt the practice of humidification, apparently because of an unwarranted fear that humidification involves risk of rusting the needles. There is not the slightest danger of rust as the result of proper practice. The chance of rust is no greater than in the card room of a yarn mill where humidifiers are now installed as standard equipment.

Humidification Needed in all Localities. Even the most favored localities do not provide sufficient natural atmospheric moisture.

It cannot be denied that a relatively humid climate such as prevails in certain districts of England, Northern France, and the New England coast greatly assisted in the initial development of the cotton textile industry.

This particularly applies to the New Bedford district —the most favored in this country by naturally humid climate. This district leads all others in the country in the fineness and generally high character of its products, and in advanced factory construction and equipment, it is noted for its generally active and prosperous condition. In view of these collective advantages there must be sound reasons to account for the fact that most of the progressive mills in this district use liberal humidifying capacity and automatic regulation throughout the entire year.

The reasons are not far to seek. Weaving and spinning are best accomplished under a relative humidity of at least 60 to 70 per cent, but unassisted natural conditions do not permit the realization of such humidities inside the mill throughout the working day at any season of the year, even in New Bedford.

Mill owners in the New Bedford district used to operate their humidifiers only in cold weather, believing that in the summer the natural atmospheric humidity was sufficient; but under these circumstances actual conditions in the mill were extremely variable and ordinarily far below what are now considered essential to good manufacture.

When the automatic regulator became available, these manufacturers discovered the advantage of eliminating the hourly as well as the seasonal variations in humidity; of operating continuously under a humidity much higher than that which nature could at any time supply them within their mills.

Summary of Advantages. While it is difficult to formulate the actual financial return from air conditioning in the cotton mill in tangible terms, we may accomplish it in a measure by reviewing the known and proved advantages and translating them into terms of product and value:

(1) *There is a marked increase in the rate of production.*

Sliver, roving, and yarn are all improved in strength since, as is well known, the fiber is stronger and more elastic. The result is a great reduction in end breakage, less stoppage of frames to piece up broken ends, less product lost in sliver and roving waste, and in lapped up end waste.

The twist per inch of roving and yarn has been materially reduced. Delivery rolls are consequently running

Knitting and Winding Room of a Large Underwear Mill.

at a higher speed, resulting in more product from each roving and spinning unit.

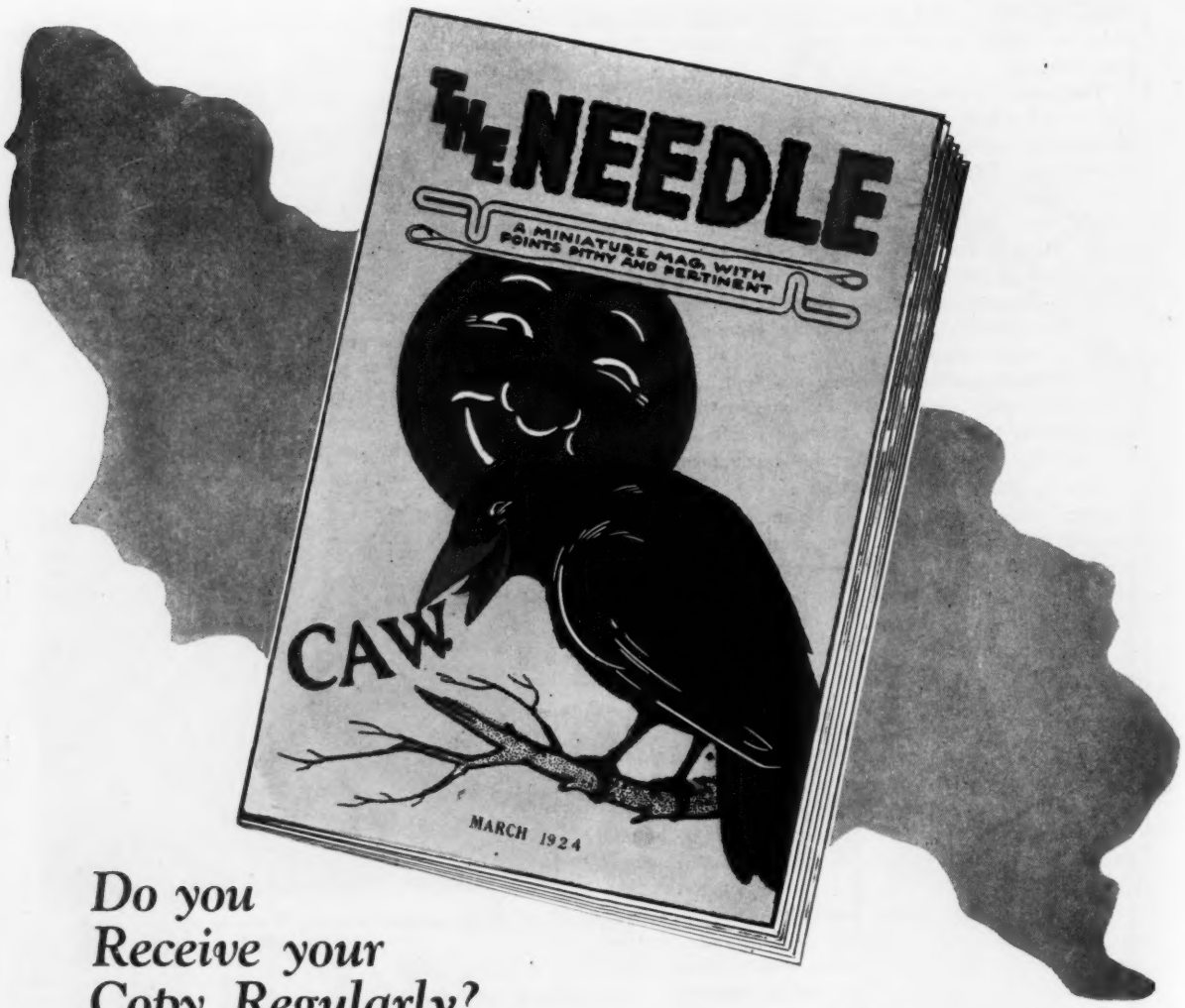
Driving belts and spinning bands or tapes are running better and with less slip. They will now retain their tension, which formerly varied with the atmospheric condition. Every machine or spindle which they drive is now running at a higher and more uniform speed than before, with consequent improvement in production.

In general, closer adjustments of machinery can be maintained to obvious advantage. No longer will it be necessary to change drafts frequently, as the outside weather changes, to keep the weight of the product uniform.

In the weave room, both warp and filling breakage have been reduced. Each loom is running nearer to 100 per cent production. Weavers find their work less harassing and exasperating. It is easier for them to operate their quota of looms and at the same time turn off a greater number of cuts.

Temperatures are considerably lower because of the heat absorbed by the vaporization of the increased amount of water. Motors are running cooler. The more wholesome and pleasant atmosphere has increased the mental and physical activities of the operatives. A higher personal efficiency is perceptible, showing in increased output and better work.

(2) *There is a marked improvement in quality of the product.*



Do you Receive your Copy Regularly?

This little magazine is being read enthusiastically by knitters all over the country. It is mailed in plenty of time for it to reach you on the 15th of each month and if you are not receiving your copy regularly or if it failed to arrive on time, don't write your Congressman that Harry New is holding out on you. . . . Your palpitating representative is probably busy fixing his fences and telling his constituents that the contents of the bottle that was dropped on the floor of the House must have been beans—because that horrible accident certainly spilled them. Just drop us a line that THE NEEDLE hasn't came, or words to that effect—and if you happen to have a good friend who is not tut-tutting in Tut's class, send his name along and we'll put him on the list to receive THE NEEDLE regularly with our compliments.

Shamaey A. Williams,

MANCHESTER NEW HAMPSHIRE

Philadelphia Office: 121 No. Broad Street.

THE CAW BRAND — MADE IN U.S.A. BY U.S.A. LABOR

KNITTING NEEDLES

The fiber in its improved condition takes the drafts more easily which, with the reduced twist and tension, combines to result in roving and yarn of more uniform weight, smoother, stronger, and better in every respect.

In direct proportion to the reduced breakage of ends there follows a reduction in the number of imperfections in sliver, roving, yarn, and cloth, which formerly resulted from the piecing of ends. The product necessarily reflects this result, the number of imperfections being reduced to the minimum, which means less "seconds."

(3) *There is a marked economy in raw material used.*

Every form of waste has been reduced and the amount of raw material which is available for finished product is therefore increased. The reduction in fly and fibers broken by the wear and tear of manufacture enables a considerable reduction in the weight of the picker lap, resulting in a greater production of yarn from each pound of raw cotton.

By controlling the regain in the product at all stages we are now controlling the dry weight of the material which goes to make up each yard and each pound of the finished goods.

The net combined result of the economy in raw material amounts to a saving of at least 4 per cent as has been repeatedly proved in actual mill tests by disinterested mill engineers. Furthermore, mill engineers find that the increase in production per operative and per machine unit, as above pointed out, ranges from 5 to 10 per cent or even more according to circumstances.

An adequate humidifying equipment in a large cotton mill will require a reasonable amount of attendance for its proper operation and upkeep, but the cost of such attendance will be considerably more than offset by the great increase in production per operative. The net annual increase in production from the same amount of material and the same payroll may be conservatively stated as not less than 4 per cent.

If the economy represented by 4 per cent of the market value of the annual product be compared with the initial cost of an adequate humidifying equipment, it will usually be found that the economy resulting from one year of use will more than return the cost of the equipment.

[This is the third and final article on Air Conditioning Practice by Mr. Thompson.]

Among the Knitting Mills.

Alden Mills, Meridian, Miss., have awarded contracts for furnishing materials and constructing a 50x100 foot, two-story brick addition to be equipped for knitting and finishing.

The Slane Hosiery Mills, High Point, N. C., have let contract for the construction of a two-story mill building. W. H. Slane is president of the company.

The American Gauze & Cotton Co., Norwich, Conn., has plans under way for the rebuilding of the portion of its mill recently destroyed by fire with loss approximating $17,000. The reconstruction is estimated to cost a like amount.

The Wayne Undergarment Mills, Inc., Lyons, N. Y., has filed notice of change of name to the Swan Knitting Mills.

The Hy-Class Knitting Mills, Inc., Brooklyn, N. Y., recently organized, will operate a local knitting mill. The company is headed by J. Spinard. F. Spinard, Woodhaven, L. I., is representative.

The Paragon Knitting Mills, Philadelphia, Pa., recently organized with a capital of $100,000, has arranged for the operation of a local plant. Harry Leidner, 5739 North Park Avenue, Philadelphia, is treasurer.

The Cartaret Hand Knitting Novelty Co. 77 Roosevelt Avenue, Cartaret, N. J., recently organized, is arranging plans for a new local plant in an existing building, for the manufacture of knit goods. Charles Roth and Samuel Schwartz, both of Cartaret, head the company.

The Pennsylvania Knitting Mills, Inc., has been granted a state charter, with a capital of $75,000, and purposes to operate a local mill. Samuel Feldman, 1735 South Eighth Street, is treasurer.

Bogen-Lewis, Inc., New York, N. Y., recently formed with a capital of $20,000, will operate a local plant for the manufacture of knit goods. Arrangements will be perfected at an early date. The company is headed by A. Bogen and L. P. Lewis; and is represented by H. H. Feldstein, 220 Broadway, New York.

The Holly Knitting Mills, Inc., New York, N. Y., has been organized with a capital of $20,000, to establish and operate a local plant for the manufacture of a line of knit goods. The company is headed by E. A. Langert and J. Greenwald It is represented by J. M. Rosenfeld, 15 Park Row, New York.

The Thieme Brothers Co., Fort Wayne, Ind., operating a local knitting mill, has arranged for an increase in capital from $400,000 to $600,000, for general expansion.

The Premo Knitting Mills, Inc., New York, N. Y., has been formed with a capital of $10,000, to operate a local mill for the manufacture of a line of knit goods. The company is represented by J. S. Siegel, Thirty-fourth Street and Broadway, New York.

The Jay-Eee Knitting Mills, Inc., Brooklyn, N. Y., recently organized, will succeed to the plant and business of the company of the same name at 688 De Kalb Avenue, and plan for enlargements in the business.

Officials of the United States Knitting Co., Pawtucket, R. I., have formed a new organization to be known as the Drummondville Textiles, Ltd., to operate a mill at Drummondville, Quebec. Arrangements for the plant have been perfected. The company will be operated as a subsidiary.

The Rodgers Co., Germantown, Philadelphia, Pa., has commenced work on a new addition to its hosiery mill at Wyoming and Stanton Avenues, to be one-story and basement, 70x150 feet, estimated to cost about $65,000. It is proposed to have the structure ready for the equipment installation at an early date.

The F. S. B. Knitting Mills, Inc., New York, recently incorporated with a capital of $20,000, will operate a local plant for the manufacture of a line of knit goods. The company is headed by A. W. Shottland, and T. W. Berkart. The company is represented by Herman Brasch, 60 Wall Street, New York.

The Greater Manhattan Knitting Mills, Inc., 8 West Thirtieth Street, New York, has perfected plans for an increase in capital from $300,000 to $500,000, for proposed expansion.

Fire recently damaged a portion of the plant for the B. & B. Knitting Mills, 310 York Avenue, Philadelphia, Pa. An official estimate of loss has not been announced.

This can help that old bank account!

What has this package of needles to do with your bank account? It can help to enlarge it just as it has helped to enlarge profits for other manufacturers, in this way—

Franklin Needles have reduced "scrap" and "seconds" more than 50% in many plants, and you know what "seconds" are costing you and what 50% would amount to in actual dollars. The Franklin velvet-smooth finish, and freedom from rough latches and rivets never frays the yarn.

Franklin Needles enable the knitter to produce more because first, her nerves are not kept on edge and she's not so likely to miss a transfer point when the machine runs smoothly with fewer interruptions. Franklin Needles don't break so often because their uniformity of temper, finish and dimension insures great strength and varying service.

Franklin Needles produce a higher quality and greater quantity production at less cost—which helps to increase the old bank account.

It pays to fill the machine with Franklins.

FRANKLIN NEEDLE CO., FRANKLIN, N. H.
ESTABLISHED 1874

TRADE FRANKLIN MARK **LATCH NEEDLES**

Bleaching Underwear Fabrics.

Editor Cotton:

We should be pleased to have, through the medium of your discussion department for knitters, some answers to the following questions relative to bleaching knit cotton fabric for underwear:

(1) Which of the various types of bleaching has been found to be the most economical; from the standpoint of operation cost; quantity of goods handled in proportion to amount invested in equipment; amount of goods spoiled?

(2) For handling 500 to 600 pounds of knit fabric per day, what equipment will be necessary?

(3) Can we use the same equipment for dyeing, and will it be necessary to bleach the goods that are dyed ecru?

(4) What shrinkage will we get in fabric knit of 16s/1 yarn, 10 needles to the inch—in other words, what size webbing will we have from a 15-inch machine after bleaching?

(5) About what would be the cost per pound for bleaching?

If manufacturing a low grade children's underwear at the present, would the installation of a bleaching plant necessitate going onto a higher grade goods?

We shall appreciate any information with regard to this matter. M. G.

Fancy Tops on Golf Stockings.

Editor Cotton:

Replying to "H. C. (Tenn.)" who asks for a method for making fancy tops on stockings.

There are several methods used and probably the best in use is the Jacquard flat machine. Before "H. C." went into the manufacture of fancy tops he would have to consider the weight of stocking he contemplated manufacturing. There are a few circular machines for making tops which are more desirable if large production is desired. For attaching the tops to the stocking a looper should be used if a best job is desired. If "H. C." will forward a stocking of the type he wants I will give him more information.

As to the inquiry of "Automatic (Ky.)" for a machine which automatically closes the toe. I know of no such machine. If he will look over the Burson stocking he will notice it has no seam across the toe. The Burson machine is not for sale. D. H. K. (N. J.)

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

The Value of Keeping a Note Book.

Editor Cotton:

The value of taking notes of valuable hints, observations, studies and tests for future reference is very forcibly realized when one tries to recall something that has been read, seen or heard and no notes taken at the time. Make notes of how a particular piece of work is done, and of the time it takes to do it, why it is done that particular way—then look it over, think about it and see if any improvements can be made that will reduce the time, do away with unnecessary motions, increase production, improve the quality of the product, make for higher efficiency, increased pay for the workers and better profits for the concern. Take particular notice of how the operation is handled, the number of motions in each operation by each operator. Ascertain why some do the work with fewer motions than others. Study the machinery, the facilities, the help, and at the same time get a line on yourself so as to measure up to the standards you expect in others. Workers will respond to the humane, efficient foreman in a way that shows increased interest taken in their work and a willingness to cooperate in all that is best for all concerned.

Having learned, through observations, tests, suggestions and discussions with those who have experience in the same line, the easiest, most efficient methods by which work should be done, then establish a standard for each operation, and the minimum motions required for each. Have the workers instructed as to the best method for doing the work, and don't fail to tell them why it is desired to have it done that way.

Don't forget to take notes. Why is production low and quality below standard? Why is there listlessness toward work on the part of the employees? Get busy with your notebook and jot down the reasons as they come to you. Are working conditions just as they should be? If not,

TUBIZE is artificial silk at its highest point of development. Tubize has always been made from nature's supreme contribution to man's comfort—cotton.

Tubize has a deep velvety finish—not an extreme glossy lustre. Tubize is soft to the touch—yet so strong and so adaptable that today it is extensively used in every known fabric, from the sheerest of delicate hosiery and underwear to the heaviest of draperies.

Its greater tensile strength is one of many reasons why Tubize has proved a real economy in machine operation and in labor costs; in winding, twisting, knitting, sizing, weaving. And on account of this same tensile strength, it is possible to produce Tubize in fine sizes, thereby creating for the manufacturer a new field of quality as well as economy.

TUBIZE ARTIFICIAL SILK CO. OF AMERICA
Sales Office, 303 Fifth Avenue, New York

why not? "Working conditions" doesn't necessarily mean the room, place or department in which the work is performed. There are numerous factors that contribute to improper working conditions. Some are poor equipment, inferior material to work with, waiting for supplies, inadequate facilities for keeping work moving in natural sequence. These are some of the causes for bad working conditions—but not all of them.

Take notes and keep records, for the time will come when they will be valuable. Don't forget that the help are taking notes, and keeping mental records of them for future use, with regard to how the work is running, the conditions under which they work as compared with the conditions in other mills on the same class of work, why some machines run better than others, etc.

Causes for low production are many, among them being old obsolete machinery that ought to have been scrapped years ago, poor arrangement of machinery, waiting for supplies, inferior materials to work with, poor planning, no system, not knowing when supplies and materials will be needed, failing to anticipate material requirements, no records kept of supplies on hand, inadequate storage facilities, no records kept of who draws out material or supplies, who ordered them, from what department and for what machine, or for what purpose they are to be used. These are a few of the things to look out for. J. J. B. (Conn.)

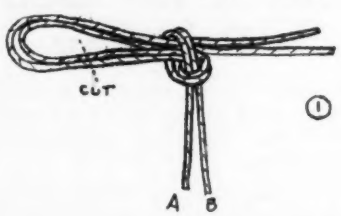
A Kink on Knots.

EDITOR COTTON:

The "kink" I want to describe in your "Knitting Kinks" section this time is a publicity campaign directed toward improving methods in winding. We decided that numerous seconds in finished hosiery were caused by the winders using the "winder's knot" instead of the "weaver's knot" (single sheet bend as a sailor or rigger would call it.) The following article and the accompanying cuts were prepared for our House Organ with this object in view:

The object of this article is to show the difference between the winder's and the weaver's knots, and to explain the advantages and disadvantages of each.

The winder's knot, to begin with, is easier to tie. That, apparently, is its only advantage. In tying the winder's

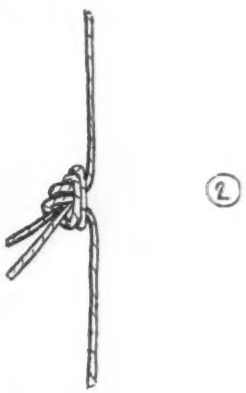


①

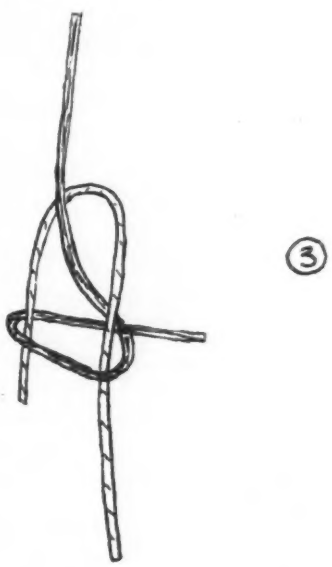
knot the two ends are placed together, held in one hand and drawn through the other hand until a sufficient working length has been reached. This drawing through the hand discolors light yarn—one disadvantage. With the doubled length, a single bow knot is tied somewhat similar to those we tie in our shoe strings. The knot then looks like sketch 1. The loop is cut near the tight side. The ends beyond the cut are pulled through and discarded, and the fixed ends, A and B, are pulled up to set the knot.

The resultant knot is similar to sketch 2, and shows its biggest disadvantage—the fact that the knot is all at one side, like a bump on the yarn. Also, the ends stick straight out. This "bump" with ends causes trouble when the silk is being knitted. It is liable to cause a press-off or a smash due to catching at the nose of the cone.

The weaver's knot is started the same way as the winder's knot. That is, the ends are held between the thumb


②

and finger of one hand. Similarly, the ends are drawn up to get far enough for a break for good yarn and then cut off with short ends. It may seem that pulling the yarn through the hand in the weaver's knot would cause the same discoloring of yarn due to soiling as the winder's knot, but this is not the case because, while in the wind-


③

er's knot the yarn is held tightly in the whole hand since the knot is made entirely from yarn above the thumb and finger, in the weaver's knot the ends are held only between finger and thumb since the knot is started on yarn below where it is held. This is the first advantage—less soiling of yarn and resulting in fewer dark streaks in light fabric.

The weaver's knot is tied as follows: One strand of the yarn below where it is held is passed, with the other hand, up and around the thumb, then through between the two short ends and gripped between the original thumb and finger. One end is then pulled through and the knot looks like sketch 3. When the knot is pulled up it looks

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
BANKERS TRUST BLDG.
PHILADELPHIA

VOLUNTEER BUILDING
CHATTANOOGA, TENN.

ADAMS-FRANKLIN BUILDING
CHICAGO

WESTAWAY BUILDING
HAMILTON, CANADA

MILLS
CHESTER, PA.

WM. SPIERS, LEICHESTER, ENGLAND

This Is a New Creation for Knitting Ladies' and Men's Hosiery and Is Different from Any Machine Ever Shown.

Makes a complete sock all except seaming of the toe. Built in gauges from 6 to 17 needles per inch.

AUTOSWIFT

MODEL "R"
Ribbed Hose

19-9, 16-5, 9-3, 6-6 White Plain Toe.

Ribbed Half Hose

1-1 top, 6-3, 5-1 or 3-1 leg.
Full range of Diameters for ¾-Hose and Ribbed Socks with or without plaiting attachment.

Any rib which divides can be made.

MODEL "P"
Plain Half Hose

1-1 Rib Top, Plain Leg, High Spliced Heel and Sole. Full Range of Diameters for Half-Hose, ¾-Hose and Children's Socks.

With or without Plaiting Attachment.

Price and particulars on request. Needles and parts kept in stock at Needham, Mass.

Visit us at Booths 68 and 69, Knitting Arts Exhibition.

SOLE AGENT

J. W. SHARDLOW

849 HIGHLAND AVE. NEEDHAM, MASS.

To the

MANUFACTURER and DISTRIBUTOR

Abundant supplies of coal, coke, iron, timber and other raw materials lie in the regions of Georgia and Alabama, which are traversed by the

Central of Georgia Railway

Cheap electric power, numerous undeveloped water powers, good home markets and excellent shipping facilities. Therefore, manufacturing conditions are ideal.

Many of the cities on the Central of Georgia Railway occupy advantageous positions for distributing warehouses, and a number of the larger northern and eastern manufacturers supply their southeastern trade from branch houses in these cities.

Full and detailed information upon application.

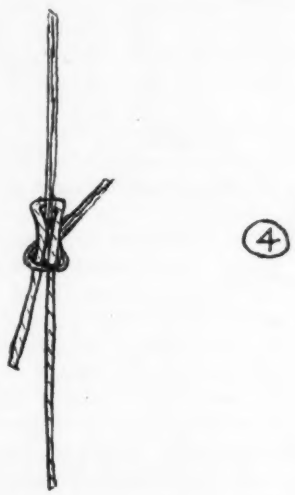
J. M. MALLORY,

General Industrial Agent

233 WEST BROAD STREET, SAVANNAH, GEORGIA

like sketch 4, which shows its biggest advantages: The knot is spread around the strand and does not stick out like the previous "bump." Also the ends lie almost flat with the strand instead of at right angles.

We originally trained only the cone winders to tie the weaver's knot, but since then have decided that its advantages are great enough to have it used entirely by both skein and cone winders.



(4)

I submit the foregoing description for the possible use of any other knitting mill managers for dissemination among their winders; it proved very effective in our case.

J. D. R. (Mass.)

Keeping a Check on Out-of-Order Machines.

Editor Cotton:

A kink which we installed some time ago has helped to improve conditions in our knitting and looping departments.

First, we had all machines numbered, and when the knitter or looper has a machine that is not working properly or that is making seconds, she doesn't go look for the fixer, but puts the number of the machine on a pad, as we call it, and then goes back to her work. Formerly we used to have a girl on the floor hunting the fixer all the time, and now, instead, she simply goes to this pad or bulletin and places the number of the machine that is out of fix upon it. Then the fixer, when he goes to the pad, sees this number, crosses it out and goes to fix the machine.

This keeps the girl from bothering the fixer when he is busy with some other machine that is making seconds. We also find that it keeps the fixer on the job all the time and keeps the girl better satisfied. We get a better production, and seconds and waste are less, because the girl and the fixer are on the job. There is also less trouble with the machine fixer, and knitter and looper.

Each evening we have the pad handed in and a new one substituted for the next day. In this way we can see which machines are giving trouble, and whether they are fixed. And if we see number 23 or number 57 or number 99 on the pad too often, we can get after the fixer and find out the trouble and see if we can help or do anything to remedy it.

This system gives us a check on the knitting and looping room. It is a mighty good plan for the mill that does not have something of the sort. The old practice of the knitter and looper running after the fixer is bad for it gets on a man's nerves to have the knitter always bothering him when he is busy with another machine.

K. Y. N. (Pa.)

Solving a Looper Difficulty.

Editor Cotton:

I am having difficulty with a Wright steady dial looper that skips, or will not pick all the stitches, and I would like to have some of the readers of "Knitting Kinks" explain how to overcome this trouble. I have the needle set as close and low as possible when entering the point at the brass, and it follows the point perfectly.

M. K. C. (N. C.)

Editor Cotton:

Replying to "M. K. C.," an advance copy of whose question was submitted to me, if he has the needle entering the point at the brass properly, and set as low as possible and following the needle perfectly, I would suggest that he see that the needle has a good sharp point on it and then look at the looper hook. When, after the hook takes the thread off the needle and comes all the way forward, see that it is low enough so that when the needle enters, it does not ride on the hump or high part of the looper hook which will cause the needle to be raised slightly. Such a raising will cause the needle to skip stitches, and, again, will cause it to only take half the stitch.

Old Knitter (Pa.)

Some Questions on Average Costs.

Editor Cotton:

I would be very glad to receive any information you could give me on the following questions regarding knit union suits for men, size 40, weight about 12 pounds per dozen garments:

What should be the average cost per dozen for seaming?

What should be the average cost per dozen for cutting?

What should be average cost per dozen for making cuffs?

What should be the average cost per dozen for sewing on the cuffs?

About how much waste is allowable per dozen, in ounces, from cutting garments?

About how much waste is usual per dozen, in ounces, from seaming?

Contributor 1060.

Editor Cotton:

The data furnished herewith in answer to your contributor refers to men's closed crotch style size 40 knitted union suit with long legs and sleeves is applicable to light, medium, or heavyweight fabrics.

The piece work cost of seaming on (Wilcox & Gibbs Flat Lock machine) entire garment including collar, shoulders, sleeves, and legs, and excepting only across the top of back flap and the seaming on cuffs is 38½ cents per dozen garments.

The piece work cost of cutting including laying up

and cutting bodies, sleeves, collars, shoulders, and flaps complete is 12 cents per dozen garments.

The piece work cost of cutting and tying in bundles twenty-four sleeve and twenty-four leg cuffs (48 to each set) total 2½ cents per set, sufficient for one dozen garments.

The piece work cost of seaming on (Willcox & Gibbs Flat Lock machine) the forty-eight cuffs to sleeves and legs complete is 8 cents per dozen garments. If this operation is being done on a Union Special sewing machine the cost is 6½ cents per dozen garments.

Records over many years of men's union suit production show conclusively that the average waste (both necessary and unnecessary) in a well regulated cutting department should be 14 per cent. Any cutting room giving a lesser percentage is operated extremely well.

I do not know how much waste in ounces should be seamed off the garments, and I do not believe it is possible to set any standard rule in this regard. One operator may average only ⅜ inch to ½ inch, while another equally efficient operator will seam off as much as ⅝ inch. I think that providing an operator follows carefully the lines of her pattern that ½ inch to ⅝ inch seamed off should be satisfactory, more satisfactory than an operator who tries hard to seam off ¼ inch to ⅜ inch, and very often does not get both edges of the fabric under the machine needles, thus causing bad work.

Production (Mass.)

The Yarn Market.

The report of the Philadelphia cotton yarn market for February as appearing in this column last month indicated a continued contraction of demand and values for the various counts during that period.

This month's report covering March will necessarily have to resemble that one in tone inasmuch as the declining prices and slackening demand were brought over, and very little of an encouraging nature can be recorded as to the business during the last month of the first quarter.

As a matter of fact, the rapidity of decrease in price was accelerated somewhat and March saw not only the largest reductions in prices for the same length of time in a number of months, but the unusual softening of the rates brought the price list down, on many of the representative counts, to a new low level not touched since August in some cases and November in others.

Two-ply skeins, basis 30s, were quoted on February 16th, and published here last month, at 54½ cents asking price. In the list hereto appended, showing the prices on March 14th, it will be observed that this number was on that day being posted at 49 cents. 30s single skeins dropped from 53½ to 49 in the same period.

26s frame spun carded yarn on cones for hosiery showed a loss of six cents, falling from 53 cents on the February date to 47 cents on the date represented by the appended list.

A fall of 7½ cents is noted for 60s two-ply combed peeler skeins and warps, which were quoted at 82½ cents on the latter date.

There were, of course, sales made at prices which varied both ways from these figures which, it is believed, represent the general average condition of the market. During the first part of the month a meeting of yarn spinners in Charlitte apparently resulted in a determination to stiffen prices, but these instances seemed to be individual rather than collective on the part of the organization, and their influence was felt only sporadically as the counts involved affected the market.

As always various and varying factors contributed to the continuance of the price decline. There was first the absence of demand which seemed more noticeable as days went by and of course played an important part as individual yarn people marked down rates in the hope that lower quotations might bring a seemingly disinterested prospect to market—but to little avail were these efforts in many cases reported.

Cotton kept up its fluctuations with a depressing effect on yarn rates, although it was demonstrated that for some time the prices paid for yarns have failed to be in line with the quotations of the raw staple, ordinarily used as a barometer for the manufactured yarn values.

An underlying cause for the dullness in yarns, as in other textiles, was pointed out to be the tendency on the part of the American family to reduce the amount in the family budget appropriated for the purchase of textiles. This, of course, affects those yarn consumers using yarns for the manufacture of wearing apparels, and household goods, probably. Their buyers maintain a hand-to-mouth day-to-day attitude in purchasing and they emulate the consumers' attitude in their dealings with the yarn dealers.

Quotations for the Philadelphia market on March 14th follow:

Single Skeins.

4s to 8s	40½	10s	41½
12s	42	14s	42½
16s	43	20s	43 @ 43½
24s	45½	26s	46
30s	48 @ 49		

Single Warps.

8s	41½	10s	41½
12s	42	14s	43
16s	44	20s	45
26s	47	30s	49
40s	57		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	42
8 3-4 tinged tubes	38½
8 3-4 hard white warp-twists	40@41
8 3-4 hard twist waste	38

Two-Ply Skeins.

8s	42	10s	42
12s	42½	14s	43½
16s	44	20s	44
24s	47	26s	48
30s	49	40s	57

Two-Ply Warps.

8s	43	10s	43
12s	43½	14s	44
16s	44½	20s	45
24s	48	26s	49
30s	50	40s	58

Frame Spun Carded Yarn on Cones.

8s	41	10s	41½
12s	42	14s	42½
16s	43	18s	44
20s	44½	22s	45
24s	46	26s	47
30s	49	40s	57
30s double carded			51@52
30s tying-in			47@48

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	60	20s	62
24s	63	30s	65
40s	70	50s	77½
70s	95 @1.00	80s	1.10 @1.15

Mule Spun Carded Yarn on Cones.

10s	47	12s	47½
14s	48	16s	48½
18s	49	20s	50
24s	52	26s	54
30s	58	40s	65

Mule Spun Combed Peeler Yarn on Cones.

10s	53	12s	54
14s	55	16s	56
18s	57	20s	58
22s	59	26s	64
28s	65	30s	67
36s	68	38s	73
40s	75		

SERVICE

LEESONA
REG. U.S. PAT. OFF.

Leesona Service is Universal

LEESONA Service reaches every civilized country in the world, bringing to manufacturers, through scientific winding, important economies and efficiency in almost every branch of the textile industry.

Preparing filling yarn for weaving by Universal Winding is an outstanding example of Leesona Service.

Similar economies have been effected in knit goods manufacture, and the silk and artificial silk industries are important users of Universal Winding Machines.

The Franklin Process of dyeing yarn in package form depends upon Universal Winding. The electrical industry uses Universal Machines for both coil winding and preparing insulating yarns, and cord twine and rope are often distributed on Universal wound packages.

Remember, Leesona Service is maintained for your benefit. It works without cost to you, solving problems of greater production, better product and lower production cost.

Write to the nearest Leesona Office today. Set a time when a Leesona engineer may set before you the proof and economy of Universal Winding.

UNIVERSAL WINDING COMPANY

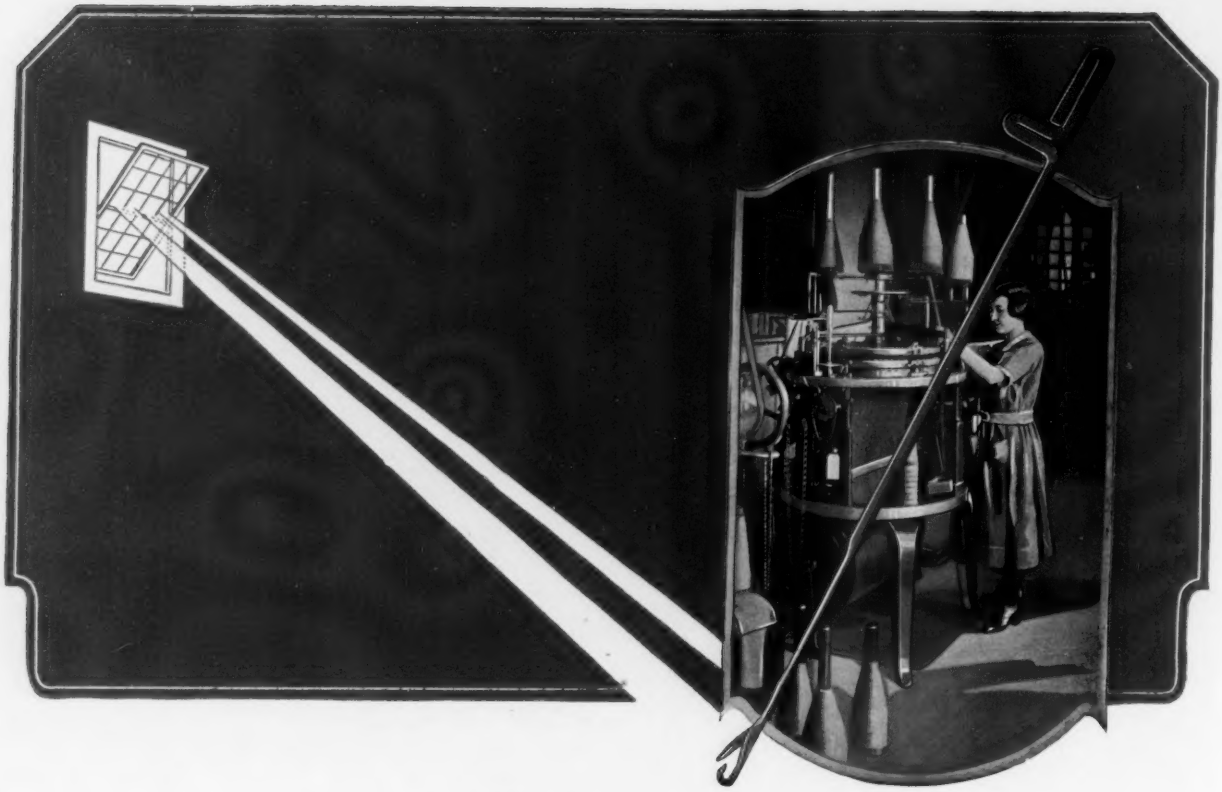
LEESONA REG. U. S. PAT. OFF.

Providence, New York, Chicago, BOSTON Philadelphia, Charlotte, Utica,

Montreal and Hamilton, Canada

DEPOTS AND OFFICES AT MANCHESTER AND PARIS

LEESONA REG. U. S. PAT. OFF.



Important as the Machine

"As the arrow is unto the bow" - so the needle is to the machine.

Consider "Excelsior-Torrington" Needles. Due to painstaking craftsmanship they reveal the fine tempered efficiency and long life that result in lowered needle costs.

THE TORRINGTON COMPANY
TORRINGTON, CONN., U. S. A.

C. B. BARKER & CO., LTD.
140-144 W. 22nd STREET
NEW YORK

LOS FABRICANTES UNIDOS
964 CALLE BELGRANO
BUENOS AIRES

MANUFACTURERS SUPPLIES CO.,
CHERRY AND JUNIPER STS.,
PHILADELPHIA

The Knit Goods Market

The knit goods markets have been kept unsettled by a shifty situation in relation to raw materials, and late March showed no evidence of anything in sight to warrant predictions of any material improvement. Jobbers cancelled hosiery orders during declines in cotton and looked askance at advances, as calculated to operate toward further restricted buying by retailers. Cotton underwear was more nearly at a standstill in the primary market than in many years, according to some of the older mill representatives. Prices of light weight garments pointed toward weakening after the middle of March, while a comparatively few jobbers were offering duplicate orders for small quantities, but almost invariably at concessions amounting in many instances to as much as the rise which went into effect some time after the opening, at a time when cotton was nearing the peak for the present cotton year to date.

Prices of winter garments held about where they had been put, but distributors were out of the market, insisting there would have to be somewhat sharp reductions before they could bank on worthwhile business from retailers. Business in sweaters and knitted underwear generally lagged in common with that in most textile lines. Mills were getting a very light skimming of new business and the few repeat orders that came along were, mainly, for summer garments and the stronger staples in winter goods. Gauged by transactions in March, business in knitted goods did not have a satisfactory spring opening.

Bright spots were to be found in ladies' silk hosiery and children's fancy top ribs, and novelties and sports stockings sold so well for some mills that there were instances of overtime operation, and deliveries in arrears at that. Trading in silk hosiery suffered some disturbance, however, by the wobbly tram silk market. Hosiery manufacturers bought best No. extra down as low as $7 a pound for thrown in the third week in March, after some had paid $7.55 a week previous. Quotations were being revised from day to day on cables from Japan.

Thrown hosiery silk was bought on March 14 at $7 a pound and on the 15th orders offered at $7.20 were declined by one large throwster. Sellers were at sea when it came to recommending manufacturers to buy or not buy. One house was urging them to contract at $7.10 while another cautioned them to buy nothing at even $7. Thus manufacturers, some of them in need of silk, were at a loss as to how to operate and whether to operate at all. During the confusion there came confirmation of reports that beginning April 1 artificial silk on cones, thrown hosiery tram and combination yarns would be sold on terms of one per cent discount 10th Prox., a change from two per cent. This, however, did not stimulate buying, and one large manufacturer stated he could buy best No. 1 extra thrown at $6.50, which was five cents under the lowest quotation for raw silk for the week.

Manufacturers felt encouraged to buy silk because jobbers and retailers were taking in silk hosiery in greater volume than had been seen for some time, but with production increasing and no knowledge as to how long activity might continue, they were dubious about contracting for silk for future, and were as much disturbed as were jobbers.

Lower prices seem to have been the major factor in the larger movement of full fashioned hosiery. Manufacturers whose lowest price was around $14 a dozen had brought out lines of less weight to sell to jobbers at $11. They were moved to do this by the fact the Phoenix Knitting Works, Milwaukee, Wis., had a number selling to retailers at $11.50. There was nothing to do but get down to a price at which jobbers could compete with the Phoenix, and it was done in short order. The Berkshire Mills was among the first to announce an eleven dollar price, for a stocking said to be of nine thread silk. The Oakbrook Knitting Mills, also in Reading, followed with an announcement it had added a stocking to sell to jobbers at that figure, and there seemed no doubt it would not be long before retailers would be selling at 35 cents a pair under the Phoenix suggested price of $1.85. The $1.50 a pair silk stocking, if not already here, soon will be, and the mills will get a bigger boost by reason of the new prices than could have resulted from the proposed cooperative campaign intended to educate the consuming public as to the physical difference between the full fashioned and the circular knit, which campaign was abandoned before it really was started.

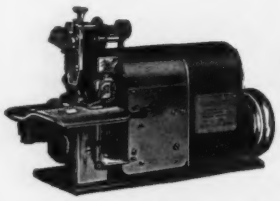
Besides adding a line of lower priced silk hosiery, the Oakbrook mill is installing twelve 42 gauge flat machines for knitting chiffon hosiery, the present big seller in silk. Formerly worn in black almost exclusively, the sheer has been popularized by offering it in a variety of the more fetching bright shades, the effect of which approximates the nude in appearance. Standard sheer stockings of full fashioned make cost the ladies two dollars a pair. Seamless made chiffons are on the market as a dollar stocking and are selling. The fashioned, however, seems to be receiving preference.

Some of the silk hosiery mills in Philadelphia and Reading are well supplied with business; most of them are not, and there is no little idleness among both full fashioned and seamless, the latter probably being the less favorably situated since the paring of prices of the fashioned. Activity among some mills is accounted for by the fact they are selling goods in the gray to others with not enough business to warrant them operating certain of their departments. For example, several mills needing business in ladies' standard weight stockings are supplying a few mills which are making only chiffons but selling both classes. By thus helping one another some mills which otherwise would not be able, are operating a part of the plant full time or the whole plant part time.

Although the full fashioned hosiery workers union has been striving to bring about a conference of representatives of their organization with manufacturers and there is fear of a strike if the conference be not called, there appears to be no accumulation of stock by way of preparation for a strike. The workers of course know that much hosiery sold as from unionized mills in Philadelphia is made elsewhere, and are desirous that the union become entrenched everywhere. At this writing it looks as though employers will not meet the union.

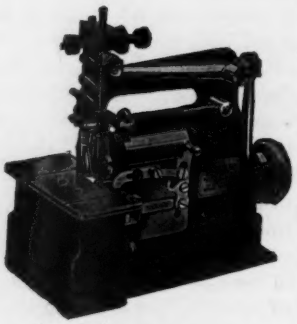
For meeting the new competition with full fashioned silk hosiery, some few manufacturers of the seamless are

MERROWING



MERROW
Reg. Trade Mark.

The Merrow High Speed Overseaming Overedging and Shell Stitch Machines.

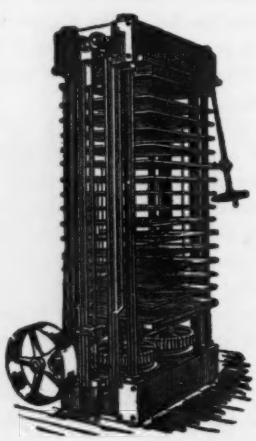


MERROWISE FOR EFFICIENCY

IT MEANS: MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

ESTABLISHED 1838
16 LAUREL ST., HARTFORD, CONN., U. S. A.



RELIANCE

Hot Plate Screw Press
FOR
Hosiery and Underwear

Write for Catalog and Prices

Reliance Machine Works
FRANKFORD, PHILA.

DIXIE MERCERIZING CO. DIXI STRENGTH QUALITY LUSTRE CHATTANOOGA, TENN.

Mercerized Yarns

C. P. Mercerized Cones and Skeins.
20/2-80/2 Natural and Gassed.

DIXIE MERCERIZING CO.
CHATTANOOGA, TENN.
Chicago Office
817 Old Colony Life Insurance Building
CHICAGO, ILLINOIS
REPRESENTATIVES: Philadelphia, Pa., Cameron & Pfingst—Reading, Pa., Cameron & Pfingst.—Canada, Slater & Co., Toronto.

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery
Cylinders and Dials

making changes in their fiber construction, by which they hope to be able to present a stocking appearing stouter than it really is, but with slightly more luster and no impairment of the wearing quality. Strange as it may seem, there are possibilities of so reducing the cost that the present popular dollar stocking may be made a more profitable retail seller at a nickel less. Anything that beats the popular price serves to still further popularize the stocking, and the lower the price the more will the ladies buy and the more work will there be for mills that know how to play the game.

Children's ribs rank second in activity in hosiery lines. The satisfactory business in the ribs, however, is in the seven-eighth length with fancy roll tops made on Wildman, Brinton and Jacquard machines. Deliveries are in the biggest volume since this type of stocking made its appearance, and many jobbers are placing substantial repeat orders. A half dozen mills in Philadelphia are running overtime, two of them operating 24 hours a day for full weeks.

A fancy top rib that hitherto has been imported extensively by some of the larger jobbers is to be made in a mill being set up in Reading, Pa., by Hans Illing, a son of a manufacturer in Germany. The mill is being equipped with machines of German construction, and already is assured of enough orders for the next season to keep it running steadily for months.

While there was volume business in misses' plain combed ribs for the current season, demand has not been sufficient to absorb production, and prices have weakened. A line from a leading mill operating a number of branches is priced $1.70 a dozen, which is five cents under the opening price of last July, notwithstanding the count of yarn from which the stocking is made is ten cents above the market at that time. Combed yarn half hose has declined since then by about as much as yarn has advanced, and mercerized goods are down with the combed.

Prices of combed half hose moved down in orderly fashion. There appeared no offers of distress goods and there were no disturbing reports of cutting in competition. Standard goods from a few mills which always are in favor among jobbers reaching the better trade slipped less, relatively, than several lines not so well known and may be said to have gone off about ten cents a dozen. A good southern stocking of 220 needles with double sole and high spliced heel is offered at $1.60 a dozen packed in a dozen pairs to the carton, and five cents more in half dozen packing. A lot of 200 needle single sole was reported to have been sold to a jobber at $1.35 for a very large quantity.

In this instance the price was 30 cents below a common quotation for low end mercerized socks with plain cotton top, which are available at $1.65. Standard full mercerized were being quoted last month at $1.77½ to $1.82½, the latter being the price named by one of the larger producers.

As a broad proposition, mercerized hosiery is one of the weaker lines on the market. An exceptionally well made number from a Philadelphia mill, however, is held at $2.75, and has sold comparatively freely at that figure.

Mercerized for ladies seems in less demand than for men's, and a distress lot was bought by a jobber at $2 a dozen for 220 needle and $2.35 for 260 needle. The latter would have been low enough at $2.75. The 220 needle had been selling in restricted quantities at $2.25 to $2.50, the last named price being that of an establishment which had made no change in more than a year. Ladies' combed hosiery necessarily has declined with mercerized, but probably not so radically.

Now that the trade has pretty well recovered from the shock produced by the February 1 smashing decline in artificial silk, fiber goods have become more nearly stabilized, but prices are low, from $3 to $3.25 being heard for ladies' fiber boot. At the lower price the stocking is made with plain cotton substituted for mercerized in the top. All fiber half hose, it appears, is to some extent being displaced by socks of fiber and tram silk in combination, prices for which vary with the proportions of the two fibers used in the combination yarn. A fairly good selling stock is of fiber plated on mercerized, which seems to have lost none of its popularity as a lustrous and durable stocking.

There still is some confusion over hosiery of tram and fiber in combination due to unsteady prices of combination yarn. An early February quotation on 150 denier artificial silk twisted with two strands of tram was $3.55 a pound. A short time later a reduction of 10 cents came out, followed by another, also for a dime. By the middle of the month this type of yarn was being offered at $3.30, and by the first of March was bought at $3.25. A nickel was sliced from this latter price before the middle of last month, and it was felt then that, in view of a somewhat stronger Japan silk market at that time, the combination thread had struck the price bottom.

A mill in Reading in March withdrew from sale its lines of half hose in fiber and silk in twist which had been offered at $3.50, a reduction from $3.67½. At the same time all fiber in two tone and printed fiber half hose were taken off sale, the goods being not attractive to jobbers at the lower prices, from which, the manufacturer said, there could be no recession except the mill operate at a loss.

Ladies' combination silk boot stockings still are strong in favor among distributors, affording as they do fine opportunity for retailers. A full fashioned line was sold down to $9.85 to a jobber who made a quick turnover on a very small margin. He saw a good market at his price, and was uncertain as to how long it might last, with innovations in construction coming out almost every week.

Cheap carded hosiery of practically all classes in March went to the lowest prices heard in many months, 144 needle sewed toe socks selling as low as 90 cents a dozen and full seamless being offered quite freely at one dollar, exceptional goods of 144 needles being held for five to ten cents more. In the 176 needle class a common quotation was $1.05 for full seamless, a mill here and there declining business at that figure and holding for $1.10. Where a price of a dollar a dozen for looped toe 176 needle socks was heard it was explained the goods were taken from stock and that no business in socks to be made on order would be accepted at that figure. In the circumstances no one appeared to know what was the market. In the language of a hosiery buyer for a leading jobbing house, "there is no market; we can buy cotton stockings for less than the cost of making them," he said, "and we believe some yarn has been bought under the cost of spinning. So what's the use of talking about a market. There's scalping all along the line, and the legitimate jobber suffers from the unstable situation, while the cheap merchant operating in a sort

New Attachments

Since its introduction, the Standard H Knitter has been recognized as having the most efficient and scientific construction of any hosiery machine on the market.

To the basic machine which is mechanically sound have been added improvements and important attachments for the production of specialties.

These lend added significance to the advantages of the Standard Knitter. For description of the new devices and information concerning those in process of development, write the consolidated concern.

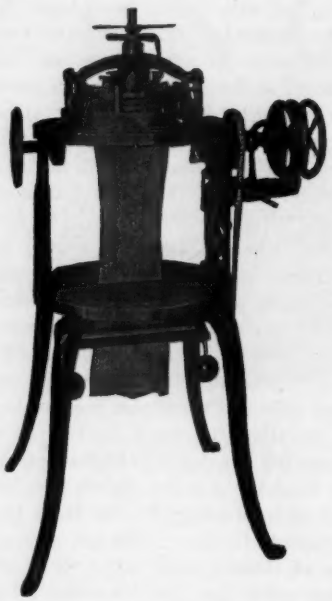
Standard-Trump Bros. Machine Co.

Manufacturers and Sole Owners

STANDARD HOSIERY MACHINES
NYE AND TREDICK KNITTING MACHINES

Office and Factory
WILMINGTON, DELAWARE

Show Room
121 N. BROAD ST., PHILADELPHIA, PA.



BRINTON BODY MACHINES

Plain or Automatic

Built in all sizes up to 24 inches. In all cuts up to 14 needles per inch.

You owe it to yourself to investigate this machine.

We also build all styles of Hosiery Ribbers and Knitters and various other circular machines for all kinds of knitted articles.

Samples, prices and patticulars on request.

H. BRINTON COMPANY
Philadelphia Pennsylvania

of speculative way seems to be thriving. But their orders hold good only when the market is going their way; when it is not, they cancel their orders and go so far as to return goods received after a break."

That not only the "little fellows" are guilty of canceling is shown in an attempt of one of the better known houses to wriggle out of an order for ten cases of mercerized goods. "As these goods are being offered for much less than when we bought them we cannot use them," the house wrote. The seller shamed the buyer into letting the order stand. In another instance a large jobber advised a manufacturer that "if the market goes lower we will look for a rebate on the goods due to reach us in April." The manufacturer, willing to keep a "good customer satisfied," said that would be all right, but made no provision for an increase in the event the market advanced prior to delivery date.

That low end cotton hosiery has not broken so sharply as many silk lines is believed to be due to severe curtailment among mills. It was rather difficult for manufacturers to reconcile themselves to the necessity for shutting down on production for a time for self preservation, but once they began doing so the safety movement gained progress, and the market seems to have been quite cleared of distress lots.

Misses' coarse gauge ribs are too low at $1.05 a dozen, yet there are jobbers who tell of buying them for less. Many houses still have ribs coming in that cost them $1.10, and these are not eager to hear of further reductions at mills. Plain combed and carded ribs are being hurt by the craze for the fancy top seven-eighths lengths, in which there was enormous increase in production last year without any flooding of the market. Jobbers still are placing repeat orders for spring, although their early orders ran large.

Some little interest was shown quite recently in men's half hose in the wool class, and it is believed some that were bought very low were intended for next fall. The purchases referred to were from a lot owned by a commission house, which was letting go of them as a 50 cents a pair retail seller. The stocking is of wool and artificial silk, in two tone and at the price, offered a fine speculative opportunity.

While it is believed in many quarters wool half hose will be no less popular next winter than for the last several seasons, it is the consensus very few wool stockings for women and misses will be worn. At any rate, jobbers are not operating or, if so, are taking no one into their confidence.

Infants' socks in the more fetching 1923 patterns continue in good call, and there is complaint among jobbers that some few mills are not making deliveries on specified schedule. Manufacturers got a late start, due to jobbers so long deferring contracts that for at time it seemed a question whether it would be wise to put goods in process until toward the end of last year, notwithstanding their samples had made a pronounced hit. Then business came along in whirlwind fashion, and mills since have been operating at capacity, now nearing the end of their season, however.

There are reasons for believing more artificial silk for infants were sold than can be delivered for the early summer. Jobbers have been fighting for rebates on the reduction in fiber silk prices, but as the goods are scarce for desired deliveries the few mills making the line are for the time in the strategic position. One manufacturer found it necessary to offer some of his business to other mills.

There is an abundance of cheap socks for infants and lots made along the lines of 1922 models. Some of these have been offered very low, one mill asking but $1.05 a dozen for a lot of 10,000 dozens, it is reliably stated by primary market factors. He received and declined an offer of $1.02½. This was a remnant of a sub-standard line and the price offered bears no relation to market value. Standard old patterns are moving fairly well from several well established mills.

Jobbers and mills selling to retailers direct are in accord that, in a general way, sales in January and February exceeded those for the corresponding months of 1923, but some of the sources of information are not satisfied with the relatively poor showing for March, due, no doubt, to rather extensive buying in the two preceding months for spring, leaving commitments for summer to be made in April and May. Retailers say weather conditions have retarded their sales, and in the rural districts complaint is heard that trade has suffered also from poor roads and, in sequence, farmer patronage of catalog houses.

The first evidence of jobber success in resisting prices of knitted light weight underwear was supplied in the acceptance of some little business by several mills at the opening prices, on which there had been advances of 25 to 50 cents for shirts and drawers and 50 to 75 cents for union suits. Manufacturers had been holding firm for the later prices, and as at the opening the goods were priced on cotton around 23 cents, they professed to see no possibility of selling underwear on that basis while cotton was hovering around 29.

But retailers were buying in a very restricted way and jobbers were in no hurry to place repeat orders. As manufacturers had about completed initial orders they necessarily were looking for new business for keeping their plants in operation. For several weeks there were strong intimations that jobbers had repeated at the opening prices, but no manufacturer could be found to admit this was true. Eventually, along in the third week in March, concessions were being offered in the way of a proposal that jobbers simply increase their initial orders at the old price. This did not look so much like a cut in price as putting the proposal in another light, but once two or three mills were found to have yielded, no matter what the pretext, the trade began to look for recessions in almost every quarter. The difficulty experienced with the advances was they would reach the retailer in the middle of his season, and there had been large sales of nainsooks, which promised, in the competition that developed, to make further substantial gains.

At this writing some of the manufacturers of light weights had made no change in their prices, and were booking duplicate business at the advances over the opening. These took the view that as last year there was a good volume of a repeat business after heavier initial selling than this year, and that the 1924 business simply was being delayed, with mills likely to put out as many cases as for the preceding season, brisk buying later on was looked for, and it was felt buyers, when forced to come to market, would pay the schedule. These manufacturers, though,

ADJUSTABLE FORMS

YES

THE-PHILADELPHIA-METAL-DRYING-FORM-COMPANY

1756 N. Randolph St. Philadelphia, Pa.

are the only manufacturers of the steam heated *Adjustable Metal Drying Forms* and steam heated *SWIVEL FORMS.*

NO

there is not any other Form which has the flexibility to board Three and Four Sizes on One Form and SAVING you STEAM— SPACE— and INVESTMENT.

Superior in *DURABILITY—FLEXIBILITY—and HEATING.*

CAN-YOU-AFFORD-TO-BE-WITHOUT-THIS-EQUIPMENT?

FOREIGN AGENTS

CANADA
WALTER W. ERISON
51 Sinicoe St., TORONTO, CANADA

CHINA and JAPAN
Elbrook, Inc., 51 Kiangse Road
Shanghai, China

SINGLE FORMS

Artificial Silk Yarns

All grades and Deniers
American and foreign
products

Largest distributor of Artificial Silk Yarns in the U. S. A.

H. S. MERITZER

303 Fifth Ave., New York, N. Y.

Phone;
Lexington 2598

Long Distance:
Lexington 2599

Cable Address: "Roberta N. Y." Codes: A-B-C-5th Edition and Bentley's.

may be said to be in a somewhat distinctive class, their lines being in special favor among certain jobbers who have handled them for years.

An Ohio mill seems likely to stick to its list to the end of the season, being well supplied with orders for heavy weights, on which it is desired to commence work earlier than usual. Some very large concerns repeating on light weights are taking from 10 dozens to a half dozen cases, most of them simply filling in. The fact they are doing this, however, indicates they have been doing more selling to retailers than was supposed, judging from their hard-luck tales. It is estimated in the trade that to the middle of March not more than 50 per cent of the normal spring shipments had been made.

Jobbers who have yet to buy underwear for next winter—excepting small lots in order to get samples—say mill prices will have to come back to near last year; that unless they do, the year's distribution will be found to have undergone a serious shrinking. Cotton ribbed suits, according to one of the better posted buyers, if bought by jobbers at current mill prices, would cost retailers around two dollars a dozen more than they paid for the winter of 1923-4. The dealers say they would have to mark suits up by 25 to 50 cents on cotton ribbed goods of 13 to 16 pounds per dozen, and that the consuming public would not pay the advance. Therefore, the buyer referred to says, it is up to manufacturers to so adjust their prices that retailers can put over the counter about the same number of dozens as formerly.

One difficulty is, it is pointed out, the dry goods jobber knows that ginghams are priced lower than last year and that several lines of cotton piece goods are no higher. It is observed that in such lines there has been sharp curtailment in production this year for the reason there were large accumulations of goods in mills, which is the explanation for the comparatively low prices. Then, too, it is not denied by well informed jobbers that last year underwear was lower relatively than piece goods. "While this is true," a jobber said, "the average dry goods retailer is not willing to look at the matter in that light. He makes comparisons with only lower prices, always ignoring the higher figures in one quarter that ordinarily might be expected to strengthen others. As we have to shape our affairs to meet the retailer we must make our fight with the mill. It is easier to win a fight with a seller than with a buyer, and of course it is human nature to follow the line of least resistance."

Manufacturers say there can be no material reduction, if any, in prices of heavy weight underwear, unless cotton goes to smash—something no one is looking for. At the market for cotton at the time this was written, the cost of the cotton entering into a 16-pound combination was greater by about one dollar than when jobbers were paying prices for which they are insisting now. Doubtless most of the cotton for the current heavy weight season cost manufacturers well above thirty cents, so that the increase is much more than one dollar a dozen, basis of actual minimum cotton content per dozen garments. One concern sometime ago quit spinning its yarn, having found it could buy for less than it had been costing the establishment to spin.

More than one primary market seller says less underwear was sold last month than in any March in his recollection, and several jobbers assert they never bought less. Some day, said one of the latter, "there is going to be a buying movement that will lift yarns, and prices of finished goods will go up accordingly. That movement will begin when the trade feels the bottom has been reached. It will be checked so soon as prices advance on the rebound in buying, and, I believe, we will see scrappy business all through summer and fall."

Sweaters are quiet as to both summer and winter garments. Spring business was much delayed by upset conditions in the artificial silk and tram silk markets and the disposition of retailers to minimize their purchases until they had moved more of their winter goods, of which there is possibility of some carryover, because of the open season. The fact retailers were in danger of being left with some of last year's numbers—which may be passed for next winter—influenced jobbers to proceed very cautiously. There had been only fair initial buying, and not much duplicate business has come through.

Sweater trades have been waiting for lower prices for worsted yarns. Manufacturers had been hard hit—many of them—by the slump in fiber silk and were disposed to take little risk with wool. Bathing suits have been dull with sweaters, but at times there was enough business being taken to force mills to take on additional yarn, and they had to pay about the prices they have been resisting for months. Knitted outerwear as a division is going through precisely what is being experienced in heavy wieght underwear and cotton hosiery in staples.

Textile Operating Executives of Georgia Hold Spring Meeting at Atlanta.

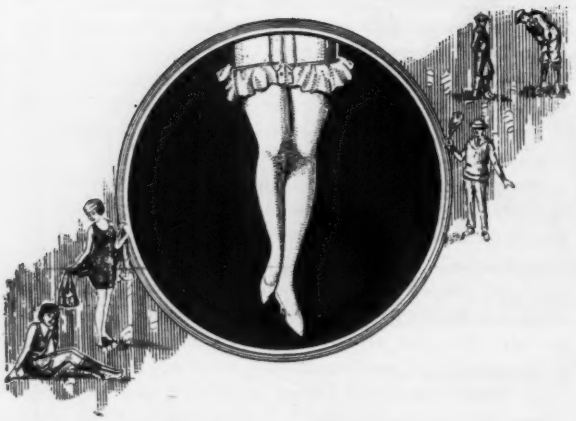
(*Continued from page* 583.)

I remember the time when I was entirely against filling wind for warp yarn. But having heard so much about it I started experimenting and now I am thoroughly convinced there are greater advantages in favor of the filling wind for warp spinning than the warp way. I have no doubt about the yarns—even if it doesn't show numerically—having a larger breaking strength. I believe the tendency is for it to be stronger. Thus far I am getting three per cent more yarn on the same bobbin. I have not started increasing speed nor taking out twist nor speeding up the spoolers. I believe we can do as well as has been mentioned.

"I think our friend's trouble is that he may not have the right device upon which to spool the filling wound yarn. A great deal depends on that. If the yarn has to be cleaned, some of these devices clean the yarn a little while spooling from the filling bobbins to the spool. We do not have to clean our yarn in the spooling.

"The reason why filling yarn has a tendency to be stronger is, when you start the frame after a doff, there is not as much twist in the yarn as when the bobbin is full. You can figure it out. You can also figure out the difference in twist at the bottom and at the top. There is a much evener twist in filling wind than in warp wind because the traveler travels only about 1½ inches—less than two inches—and the change from the empty to full is less. I think the figures, if followed up closely will show something in favor of the strength of the yarn. I have no doubt that the filling wind is the right thing over the warp wind."

"Isn't filling wind more advantageous on lighter yarns than on heavy yarns?" asked Mr. Newsom. "Say on 16s



Helping Famous Hosiery Manufacturers to Uphold Quality

FAMOUS manufacturers of fine hosiery and knitted wear are retaining their leadership simply by sustaining the superior quality of their products.

Granite State Latch Needles are doing their part to help them uphold this quality. They demand Granite State Needles because they know from experience that they are ALWAYS DEPENDABLE and enable the machines to run continuously and smoothly with fewer interruptions —they know that Granite State Needles don't break so often—they know their satin finish cannot fray the yarn as there are no rough latches—they know that every Granite State Needle is exactly like the previous one as they never vary in uniformity.

Granite State Needles not only make smoother running machines but smoother tempered operatives, for there are fewer exasperating stoppages and fewer "seconds."

Here's a needle that is becoming as famous with knit goods manufacturers as their products are becoming famous with the public. Here's a needle you can confidently put on the finest fabric and know that it will help to make the fabric even finer. Fine quality needles for hosiery and underwear machinery.

GRANITE STATE NEEDLE CO.
LACONIA, N. H.

GRANITE STATE
LATCH NEEDLES

MORE
SOUTHERN SPINNERS
are using

AMTEX
TRADE MARK REGISTERED

SPINNING, TWISTING AND SPOOLER TAPE
Than ever before

This increasing demand indicates the superiority of AMTEX Tapes over all others.

We are pleased to build special Tapes for your particular needs.

Send us your specifications and we will guarantee satisfaction.

Manufactured by

AMERICAN TEXTILE BANDING CO., INC.
GERMANTOWN, PHILADELPHIA, PA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
Wilson Company, Greenville, S. C.

You All KnowThis Box

and above, isn't it better than on numbers below that?"

"I should think so," said Mr. Phillips, "although I have never spun that yarn."

"I would like to hear from Mr. Dave Reid," suggested Mr. Newsom.

"I like it on coarse yarns," responded Mr. Reid, "but I have never been able to get a satisfactory tension on the spooler."

Mr. Howarth said at Lanett they get as good results on 12¼s as on 16s.

Leaving this discussion, Mr. Phillips said that "it seems to be the consensus of opinion that most people who have tried filling wind stand by it."

The next question was: "At relatively high roll speeds is there a loss in the breaking strength of the yarn? If so, is it due to the rate of drafting or to the high spindle speed or other cause?"

Answering this, Mr. Edwards, of Rome, said, "I am fortunate in having one of those jobs that doesn't require anything from me and so I have time to experiment. I will say I was on 9s regularly and we were running our spindles about 8,600 r.p.m. I did not change the spindle speed and increased to where I had 30 frames on finer numbers and so I was into it. We were putting in five times the square root and we were getting 162 turns on the warp, but I got to experimenting and made something like 240 different tests. I worked back and forth, starting today and changing back to where I started. I changed my gears every hour in the day so as to get the average relative humidity and make the tests absolutely impartial. I decreased my spindle speed down to about 7,400 and made experiments with different turns of twist down to 3.39. I found that by cutting my spindle speed and decreasing my twist down to 3.39 my breaking strength increased until I got to 3.39 twist and then it changed, and below that it decreased proportionately. We decided to play on the middle ground and we have 4.75 times the square root and we are getting 166 on the front roller. I increased the breaking strength on that yarn by cutting the spindle speed, taking out twist and increasing the front roll speed four turns per minute."

"Did the yarn weave as well with 3.39 as with 4.75?" asked the chairman.

"Yes, sir," answered Mr. Edwards.

"Then why didn't you stay there?"

"Well, we figured that was the minimum amount of twist consistent with good work and strength and we decided it would be best to stay about medium."

"All my yarns are doubled and twisted and there is some loss in the ply yarns," explained Mr. Edwards. "Furthermore, we are in a chain of mills and our stuff has to tally up with that of the other mills. I had rather cut my spindle speed and take out twist down to 3.39 where I find my best results, but our goods must come up to the other mills we have to sell with."

"With my experience," commented the chairman, "I think the higher the spindle speed the weaker the yarn. We have run 4.50 and got better results, better weaving yarns than we had at 4.75 and above."

The next question was, "In your opinion which is better: a large bobbin and a large ring or a small bobbin and small ring?"

"Depends on the size of the yarn," said Mr. Hampton. "On 4s to 8s I would prefer a large bobbin and large ring, because you can get more yarn on the bobbin and your bobbin will be heavier and it will not jump so badly in the cradle. I would much prefer, up to 8s, a large bobbin with large ring. Past 8s, a small bobbin and small ring."

"That gets us back to the previous question," declared Mr. Edwards. "I can't see why a man, if he can run a ¾-inch bobbin with filling wind, can't do it with warp wind. I can do it with warp. Yet some of them say they cut down from ⅞ to ¾ inch by going on to the filling wind."

"There is this disadvantage with warp wind," explained the chairman. "When you start up after doffing your work always runs worse, especially if you've got it speeded high. You have your worst work when it starts and then again when it gets full, although in the middle it runs good. That's where the filling wind has it all over the warp wind. When you start off on warp wind you have a lot of strain on the yarn until it is about one-third full; at half full it runs like a top, and then when it gets full it whips together, the traveler is too light—while on the filling wind it is nearer the same thing all the way up."

Mr. Anderson, of New Holland, was next requested to relate his experience with different size bobbins.

"We have the two-inch ring with a one-inch bobbin spinning 20s down to 8s," he said. "We used to have considerable trouble with the work running badly at the start of the bobbin. We found by increasing the size of the bobbin that when we put in a larger bobbin then we could get a lighter traveler and make the work run good all the way through. Before we did that, if we had a traveler light enough to make it run good at the start it would be too light when it ran full. On 20s and under I should say a large ring and a large bobbin.

"We tried filling wind," continued Mr. Anderson, "and have tried it for the last seven or eight years. Jimmy Strang talked to me about that a long time ago, and we experimented with it and we have tried every spooler tension device we have ever heard of but we have never been able to find where we could get any greater advantage. We got about five per cent better breaking strength, and took out twist, and increased the front roll speed, but always got in trouble in the spooler room." Mr. Anderson added in reply to a question from Mr. Edwards that he has a 7½-inch traverse—and that he could not put as much yarn on with the filling wind.

"Is there any way to put on filling yarn so as to prevent making slugs in the cloth without using a feeler motion?" was the next question read from the questionnaire for discussion. It was explained that the word "slug" in this meant the doubled end of filling left in the cloth after the yarn had all run off the bobbin. It was the consensus of opinion there is no way to overcome this except by the use of the feeler motion. Mr. Howarth related an experience he had with a sample when he cut the filling about a half inch from the end of the bobbin, but this could not be done practically.

Mr. Phillips next asked, "Why is it that extra twist on the speeder makes better running spinning? Or does it?"

Naturally, it seemed from a vote, all the spinners present thought it does run better. Among the written replies received were:

"Yes, it does. Not sure of the reason"—"Enough twist

should be put in speeder roving to prevent breaking back or stretching in the spinning room. I can't see where any additional twist would be beneficial."—"On our work, standard twist or one tooth less makes spinning run better."—"It does not make better running spinning if you have enough twist in to unwind without stretching roving. That is all I want."—"Roving with too much twist will not run better, but twist enough to keep roving from stretching will run better."—"Yes, because roving is not stretched and weakened."

The size of top roll weight with single boss roller for the different numbers of yarn was the next thing discussed. In the written replies, J. C. Edwards, of Rome, had indicated "18 pounds on 7s to 16s," but in explanation at the meeting said this was a total of 18 pounds of weight on the roller. He said he uses a 1¾-pound weight but that his leverage gives him 18 pounds pressure. He indicated a preference for 20 pounds. "I have changed mine," he said. "Recently I cut out my levers so I was putting on 22 pounds, but at that time we were running more twist in the card room than now. I would prefer 20 pounds on 7s to 16s, however."

He answered a question from Mr. Strange saying he used a three-inch roller.

In response to a general question it was indicated by a number that they had changed the weight to one somewhat larger than that supplied by the frame-makers.

Among the replies received by mail were:

"On 3½-inch gauge I find 2½ or 3-pound weight best; and on 4-inch gauge, 3½ to 4-pound weight."

"Our numbers are 20s to 23s and we find a 3-pound weight gives better results than 2 pound."

"We find a 4-pound weight is best for 18s yarn."

"We use same weights furnished with the frames. Wider gauge frames having heavier weights and all these are run on coarser counts.

The final question taken up was: "Should there be any difference in the percentage of humidity on the same numbers of warp and filling?"

Mr. Phillips reminded the men in connection with this question that after a damp spell the warp will start right off in the morning and run like a top while it will sometimes be eight or nine o'clock before the filling gets going good. This, it was pointed out, is due to the fact that the warp has more twist in it. On this account, said Mr. Phillips, the warp will require more relative humidity than the softer-twisted filling.

J. W. Hames, superintendent of the Exposition Cotton Mills, Atlanta, said that "we have our filling and warp in different rooms and find that about 55 per cent on the filling and 65 per cent on the warp is best." Among the written answers to this question were:

"No, there should be no difference; filling may be conditioned in a damp room after spinning."

"We use the same on both but it is our opinion that we ought to have five per cent more on the warp."

"That's hard to determine. Sometimes I think so, but then at another time something upsets the idea. For all-around humidity conditions, 58 to 60 degrees is hard to beat for an average."

"Yes, we find on 21s warp that we get best results with 85 per cent, and 75 per cent on filling."

"Yes, 70 per cent on warp, and 65 per cent on filling is best."

"About 65 per cent on warp and 50 to 60 per cent on filling."

This concluded the discussion, and Mr. Phillips thanked the men and turned the meeting over to the general chairman, who, after several announcements, declared the meeting adjourned.

Federal Suit Dismissed.

The suit of the United States vs. The Nashville Industrial Corporation in which the government sought to set aside the contract of sale of the Old Hickory Powder Plant at Old Hickory, Tennessee, on allegations of fraud, was dismissed by a decree entered in the Federal Court at Nashville February 23, 1924. Admission was made by the government that no fraud had been practiced by the Nashville Industrial Corporation.

This ends the litigation started in November, 1922, which resulted in suit being filed August 1, 1923, and the appointment of receivers, who have operated the property from the latter date to the dismissal of the suit.

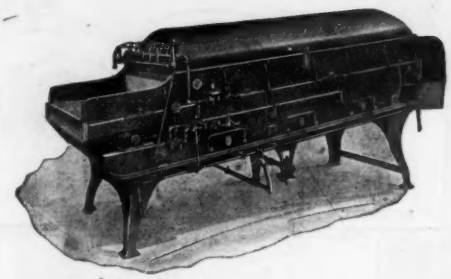
The industrialization of Old Hickory, which is now well under way with the location of the du Pont Fibersilk Company and the Nashville Pulp and Paper Plant, together with other industries, seems to be assured, and a valuable and permanent asset to Nashville has been made from this great war expenditure. Desirable sites are still available for those looking for a southern location. Many buildings suitable for immediate occupancy can be secured at advantageous prices and terms, and the corporation is now in a position to proceed with its business unhampered and with a clear title to its property.

The 48th annual edition of "Cotton Facts" has been issued. This edition retains the usual statistical tables and other features which have made this book invaluable to the cotton trade, and many new tables and other matter have been added. The most important of the new features consists of a series of tables showing the daily high and low prices of the active months on the New York Cotton Exchange during the season 1922-23. Other new features include a table showing the price of spot cotton in the New York market on every business day of the cotton year; tables showing the overland movement of the American cotton crop; the proportional distribution of the crop; spread of the boll weevil in 1922; the extent to which fertilizers have been used; quantity of calcium arsenate consumed; and consumption and stocks of cotton in Germany since the war.

Shepperson Publishing Company, 16 and 18 Exchange Place, New York City, are the publishers.

William W. Arnold, Jr., who for eight years has been superintendent of the Manchester Cotton Mills, at Manchester, Ga., has, it is reported, been made general superintendent in charge of manufacturing of the Unity Cotton Mills, at LaGrange, Ga., the Milstead Mfg. Company, at Milstead, Ga., and the Manchester Cotton Mills. Oscar D. Grimes recently resigned as superintendent of the Milstead Mfg. Company. The three mills involved are owned by the Callaway interests of LaGrange.

Just A Minute!!



ONE MINUTE is all the time required to restore the proper degree of moisture and thoroughly and uniformly condition your yarn with the SARGENT Yarn Conditioning Machine.

SARGENT
YARN CONDITIONING MACHINE

No more "Kinky Filling"—a thorough, accurate and rapid conditioning of your filling yarn.

There's many good reasons why so many mills use the SARGENT! Ask us about them.

C. G. SARGENT'S SONS CORPORATION

GRANITEVILLE, MASS.

Our Southern Agent is
Mr. Fred H. White.
Charlotte, N. C.

AUTOGYP

Process of Bleaching and Dyeing
IN ONE OPERATION

For Producing

QUALITY COTTON GOODS

Goods processed by AUTOGYP command a higher selling price because of superior finish and appearance. A comparison of garments treated by the various methods will amply prove this.

A representative will gladly demonstrate the AUTOGYP process in your own plant. Send for descriptive booklet.

Softer Feel

Lustrous Appearance

Uniform Coloring

Full Knitted Elasticity Maintained

Absence of Harshness and Boardiness

Unimpaired Fibre Strength

Surpass Chemical Co., Inc.
Office, Factory and Laboratories
1254-1256 Broadway, Albany, N. Y.

EVERY TIME THE CLOCK TICKS

It is being shown every day in many Mills throughout this country and abroad that 50c or $1.00 can be saved through the use of the right "Hurricane" Dryer in the handling of a single thousand pounds of material, and that it can be wasted without it. Even at 50c a thousand and 5,000 pounds a day there is $2.50 for each of the 300 business days in the year, or $750.00 saved in one round of the calendar.

Write for Catalog On
Dyeing, Drying or Finishing Machinery

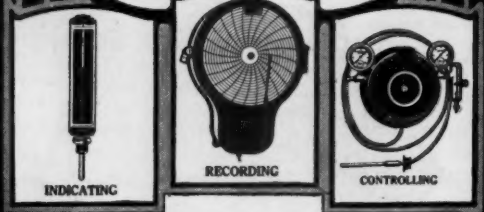
The Philadelphia Drying Machinery Co.
Stokley Street above Westmoreland, Phila., Pa.

New England Agency
Hurricane Engineering Co. of Mass.
53 State St.,
Boston, Mass.

HURRICANE
Ideal Drying Every Day

Canadian Agents
Whitehead, Emmans, Ltd.
Montreal & Hamilton

Tycos
temperature instruments

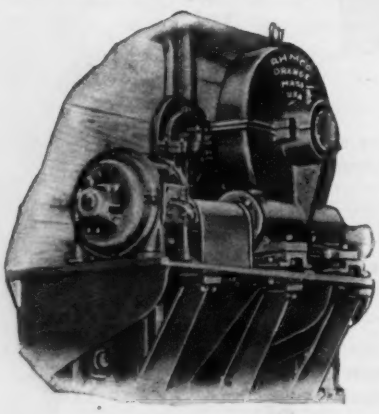


A decision for *Tycos* means ultimate savings in dollars as well as quality.

Ask for particulars.

Taylor Instrument Companies
ROCHESTER N.Y. 858
There's a Tycos or Taylor Temperature Instrument for Every Purpose

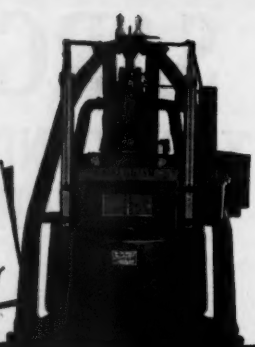
RODNEY HUNT MACHINE COMPANY



"RODNEY HUNT"
WORM DRIVES
for Dye Tubs
Bleaching Machines
Washers

Save Power, Space and Upkeep
Booklet 1119

RODNEY HUNT MACHINE CO.
47 MILL STREET ORANGE, MASS.



The "HUMATIC"
AMERICAN
Hydro-Extractor

Leaves your operator free to attend to other work

He has only to set the Automatic Timing Device, load the basket, and pull down the Safety Cover, the HUMIDITY does the rest. A At the end of the period specified, it stops itself and signals the extractorman to come and unload. There are many more interesting and valuable features. Find out about them—write today.

The American Laundry Machinery Co.
Specialty Dept. C, Cincinnati, Ohio
The Canadian Laundry Machinery Co., Ltd., Toronto, Can.
British-American Laundry Machinery Co., Ltd.
36-38 Victoria St., London, S. W.-1, England.

Automatic *Safe!*

Turbine Extractors Save Money

Your extractor costs can be materially reduced by the installation of Steam-Driven Turbine Extractors. Fletcher Turbines not only reduce costs, but give longer and more dependable service than any other extractor.

Tell us your extractor requirements and we will prove to you the economy and greater efficiency of Fletcher Turbine Extractors in actual service.

FLETCHER WORKS

INCORPORATED

Formerly SCHAUM & UHLINGER

GLENWOOD AVENUE AT SECOND ST., PHILADELPHIA, PA.

BOSTON, MASS. SAN FRANCISCO, CAL. PORTLAND, ORE.
CHICAGO, ILL. LOS ANGELES, CAL. CHARLOTTE, N. C.

"The World's Best Dyeing, Bleaching and Scouring Machinery."

DURABLE K-W UNIVERSALLY USED

"The World's Best Dyeing, Bleaching and Scouring Machinery."

A Mark That Means Intrinsic Value

The hundreds and thousands of Klauder-Weldon machines now in use have, by their accomplishments, steadily and irresistibly built up a reputation that has made "KW" synonymous with the "world's best Dyeing, Bleaching and Scouring Machinery."

That which deserves to live—lives. The fact that Klauder-Weldon Machinery is still good after over a half-century's use in scores of mills is proof that it has deserved to live. The fact that this same machinery, after the long ravages of live steam, heat and alkalis is still more efficient and economical than any other modern machinery of its kind, is one reason why we can say, without boasting, that it is "The World's Best Dyeing, Bleaching and Scouring Machinery."

The leading mills use them because they can buy no better at any price—the smaller mills use them because they are the most economical in ultimate cost.

You take no risk when you buy a K-W Machine. You MUST be satisfied, for K-W reputation must always be maintained. Our years of experience and the efficiency of our methods of manufacture guarantee economy in first cost, and economy throughout a long life of efficient service under the severest usage.

Our engineers are at your service, and will be glad to offer suggestions solving any finishing problem in your mill, without obligating you.

KLAUDER-WELDON

DYEING - BLEACHING - SCOURING - MACHINERY

THE KLAUDER-WELDON DYEING MACHINE CO.

BETHAYRES, PA., U. S. A.

H. G. Mayer, Southern Agent, Realty Bldg., Charlotte, N. C.

STRAIGHT TO THE MARK—

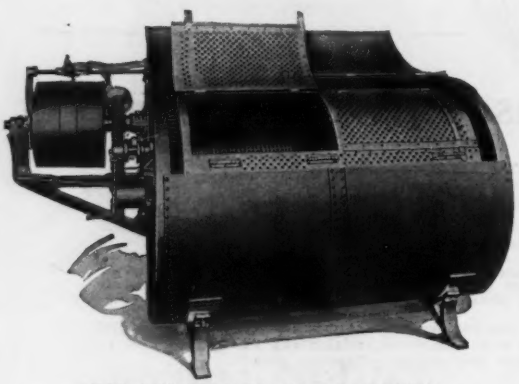
Shade
Strength
Uniformity
Value

Katigen Deep Black GGN Conc.

The Grasselli Chemical Co.

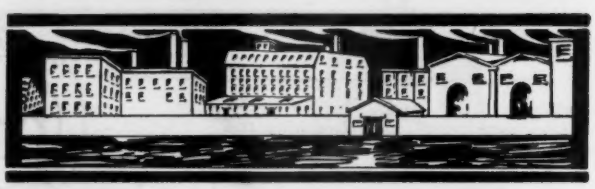
DYESTUFF DEPARTMENT
117 HUDSON STREET NEW YORK
Chicago Philadelphia Providence Charlotte Boston
San Francisco New Orleans

ROME DYEING MACHINE
MONEL METAL



BUILT IN SIZES 50 TO 300 POUNDS

We also manufacture
STEEL ROTARY DYEING MACHINES
and
Storage Tanks for Sulphur Dyes
Rome Machine & Foundry Co.
ROME, GA.



Warren Soaps

Preferred Stock

The best quality tallow, palm, and red oils and olive foots, carefully balanced with the purest chemicals for your special purpose.

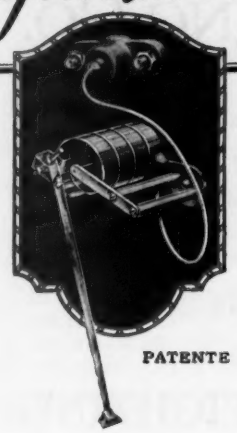
Uniformity guaranteed by test before shipment.

Warren Soap *Warren Service*

Warren Soap Mfg. Co.

Established 1870
77 Summer St. Boston, Mass.
Incorporated 1890

You have to know the combination



It's no mean job to keep some recording instruments accurate.

They tell you to:

Turn this knob to allow for weakening of the movement, rheumatism or old age.

Tighten that screw to take up wear.

Adjust such and such lever to keep the pen from running off the track.

Twirl yonder nut so that the pen arm won't wobble.

It's fun if you have time.

If your time costs money—if you feel that you need dependable records, specify Foxboro Recorders with the Improved Helical Tube Movement.

Foxboro Records are guaranteed accurate within 1% of total scale reading.

This accuracy does not vanish like color from a coal.

The Improved Helical Tube Movement is permanent in calibration. No adjustments are necessary.

It will not fatigue, split, crack or leak even when subjected to excess pressures that carry the pen way beyond the outer edge of the chart.

It can be used constantly at maximum range without loss of accuracy. No "working range" is specified.

Install Foxboro Recorders and be sure of records that are accurate without your help.

Write for Bulletin 154-A S

THE FOXBORO CO., Inc.

Neponset Avenue, Foxboro, Mass., U. S. A.

New York Chicago Boston Philadelphia Pittsburgh
Cleveland Rochester Birmingham Tulsa
Los Angeles San Francisco Portland, Ore.

6076

FOXBORO

REG. U. S. PAT. OFF.

THE COMPASS OF INDUSTRY

Stein, Hall's

HAWK
THIN BOILING
STARCH

CLEAN
FULL STRENGTH
UNIFORM
DEPENDABLE

Your order will receive careful attention, whether it be for one bag or a carload.

STEIN, HALL & CO., INC.

61 Broadway, New York

Boston **Charlotte, N. C.** **Chicago**
Providence **Troy** **Philadelphia**

QUALITY AND SERVICE SINCE 1866

THE ARABOL MANUFACTURING CO.

OFFICES:

110 East 42nd St.
(New Bowery Savings Bank Building)
New York City

WORKS:

Brooklyn, N. Y.—Cicero, Ill.
—Brampton, Ont.

EXPORTERS—MANUFACTURERS—IMPORTERS

of any kind of Compounds for

SIZING SOFTENING FINISHING WEIGHTING

for all Textile Purposes

Sizing Tallows, Filling Materials, Printing and Stiffening Gums, Rosin Soaps, Dextrines

Soluble Oils, 50%-75% Guaranteed

Boil-Off Oil **Degumming Oil** **Hosiery Oil**

Many years' practical experience of our technical staff enables us to meet all your requirements. Our Textile Research Laboratories are at your disposal. Your correspondence and trial orders are solicited.

Tested and Proved

It is not difficult to attain a given result provided those means are used which experience has tested and proved.

The use of

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

has proved again and again their ability to produce softer texture, brighter color, and better quality appearance to textiles.

This is the reason why increasing numbers of textile mills are standardizing the use of these special purpose alkalies.

Ask your supply man.

The J. B. FORD CO., Sole Mnfrs.
WYANDOTTE, MICHIGAN

Staley's

Whether purchased in train load lots or single bags, Staley's Eclipse Thin Boiling starch is always the same, varying neither in quality nor results obtained.

Staley's Starch is accurately processed to the work it is required to perform. This is assured by the most scientific methods of control, maintained with the aid of plant and laboratory facilities that are the most modern and comprehensive in the textile industry. Write for samples and prices.

A. E. STALEY MFG. CO.
DECATUR, ILLINOIS

508 Andrews Law Bldg., Spartanburg, S. C.
J. W. Pope, Ansley Hotel, Atlanta, Ga.
25 Church St., New York City
88 Broad St., Boston, Mass.

Starch

DIASTAFOR

An Important Message to the Textiler

DIASTAFOR is a Money-Maker for You. It will improve the quality of your fabrics and increase your Sales.

DIASTAFOR is the safest and most reliable "de-sizing" agent for use in connection with the Dyeing, Bleaching, Mercerizing and Finishing of Cotton and Mixed Goods.

In the processing of piece goods, DIASTAFOR quickly and effectively removes all starchy materials by converting the starch into sugar which is readily dissolved and washed out.

The use of DIASTAFOR is simple and easy. It may be readily employed by the "non-technical" man.

DIASTAFOR eliminates the danger of tendering which is so likely to result from the use of acids.

DIASTAFOR imparts a full soft handle to the fabric, results in a closely adherent finish and at the same time materially reduces the tendency to shrinkage.

DIASTAFOR substantially reduces the amount of caustic normally used in the kier and results in a much cleaner kier liquor.

DIASTAFOR

"Standardized and Reliable — Can Always Be Depended Upon"

Give DIASTAFOR a trial. Write to us for full particulars.

THE FLEISCHMANN COMPANY

695 Washington St. Diastafor Dept. New York, N. Y.

DIASTAFOR WAREHOUSES

BOSTON, MASS. CINCINNATI, OHIO NEW YORK, N. Y. PHILADELPHIA, PA.

Representative: MR. HOWARD L. JENKINS

DIASTAZYME

A product for the conversion and removal of starches, sizings, etc.

DIASTAZYME is especially adjusted for textile use, having high starch liquefying power.

Ask for sample. The product will prove itself.

Jacques Wolf & Co.

PASSAIC, N. J.

"ARTCO" SILK OIL

for

***use on* Artificial Silk**

Hosiery and Sweater Knitters find "ARTCO" Silk Oil to be the best product for this purpose.

Prevents waste and saves time

Softens the Thread and lays the Fibre, and produces a Fine Lustre.

Samples and full information on request.

Manufactured only

by

QUAKER CITY CHEMICAL COMPANY

Broad and Lehigh Ave.
Philadelphia

Rohm & Haas Company Inc.

Manufacturers of

CHEMICALS

PHILADELPHIA, PA. BRISTOL, PA.

SODIUM HYDROSULPHITE—
Sulphoxylates and Allied Products.

LYKOPON—Sodium Hydrosulphite—
For reducing Indigo and vat dyes. Of highest quality and absolutely standard.

FORMOPON—For discharging.

FORMOPON EXTRA—For stripping.

PROTOLIN—For stripping.

INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

Represented by

The MAKENWORTH COMPANY
Greensboro, North Carolina

Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.
Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

Concentrated Sodium Sulphide

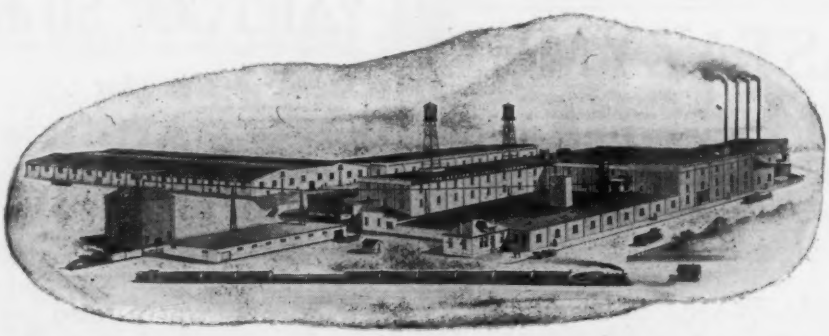
Crystal Sodium Sulphide

Also manufacturers of the following chemicals:

ALUM	GLAUBER SALT
SULPHATE OF ALUMINA—	OIL OF VITRIOL
Iron Free	NITRIC ACID
PAPER MAKERS' ALUM	MURIATIC ACID
WATER FILTRATION ALUM	NITRATE OF LEAD

Represented by

The MAKENWORTH COMPANY
Greensboro, North Carolina



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. DANIEL H. WALLACE, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

Uniform in Application

VICTROLYN

Penetrating, Lubricating, Dependable Assistant in Warp Sizing

KLORASENE

will remove Oil Stains.

If you are troubled, write us.

BOSSON & LANE

Manufacturing Chemists

ATLANTIC, . MASS.

"BRETON"

MINEROL

For Plushes and Velvets

"It gives a silky lustre"

BORNE, SCRYMSER CO.

Established 1874

17 Battery Place, NEW YORK

BOSTON PHILADELPHIA

Works: Elizabethport, N. J.

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

Oldest in Years. Youngest in Spirit
Modern in Ideas. Progressive in Methods
"Service" Our Motto

All kinds of
Warp Dressings, Finishing Materials, Soaps,
Soluble Oils, Etc.

Please Submit Your Problems to Us

ROLLER
CLEARER
SLASHER

Quality and Service

CLOTHS

Manufacturers are obtaining such perfect results from our Roller Cloths because it is made of the right material, with just the right cushion and uniformity of surface.
Our Clearer Cloth is constructed of the highest grade materials with strong nap that does not pull out and its uniform length is such that rolls are cleared entirely of short fibre.
Our Slasher Cloth is of the same high quality construction. It has sufficient cushion and is porous enough to thoroughly force the sizing into the yarn.
A small trial order will convince you of the superiority of these perfect cloths. Ask for samples and prices.

PHILADELPHIA FELT CO.

FRANKFORD, PHILADELPHIA, PA.

Fitz. Lee Putney. Treasurer

Southern Sales Agent, M.C. Sanders, Greenville, S.C.

SAVOGRAN

THE STANDARD FLOOR CLEANER SINCE 1875

The Industrial Cleaner

The unsightly appearance, inconvenience, and danger of oily, dirty and slippery floors has been splendidly overcome by the use of SAVOGRAN.

Used where owners take pride in the cleanliness of their large floor spaces.

Textile Mills of national repute in every part of the country have found that SAVOGRAN cleans clean—and at a minimum expense.

It cleans in less time—saving labor.

It does more work per ounce—saving money.

It kills obnoxious odors thereby destroying sources of disease—saving lives.

It gives satisfaction—saving trouble.

For results and economy use SAVOGRAN.

The Well Built Cleaner

SAVOGRAN is made of only the purest materials. All raw stock is carefully analyzed to make sure the high standard of quality is maintained. It is this uniform excellence that has made SAVOGRAN the best cleaning powder for nearly half a century.

Every bit of it is soluble. No inert fillers, to cheapen the price and increase the weight, are used.

It is a dry powder—only a small amount is needed to do the work as it is not made bulky with moisture.

It does not deteriorate and lose its cleaning strength.

On account of the scientific blending of ingredients it will not injure the surfaces or harm the cleaners' hands.

All the above added to the fact that SAVOGRAN has stood the test of time, guarantees it to give satisfaction, economy and best results.

INDIA ALKALI WORKS

"Ask Your Supply House"
or write direct.

BOSTON 28-37 India Wharf MASS.

Guaranteed Textile Brushes

PERKINS PRACTICAL BRUSH

ATLANTA BRUSH COMPANY

What the P. A. Learned

The P. A. (Purchasing Agent) was a smart buyer. Make no mistake about that. If he hadn't been, he wouldn't have had his job.

But he wasn't a brush man. Didn't claim to be. The other day our service manager, George Snow, called on him. And, as luck would have it, he had two comber dusters on his desk. One was made by us. The other was an imitation that looked very much like ours.

"Sorry, George," said the P. A. "I've got you beat on price. We can't trade today."

"Price of what?" said George.

"These two brushes," said the P. A.

Then George grinned and said, "Why, Mr. P. A., those two brushes are no more the same than day and night." And then he showed him.

When he'd finished, the P. A. was impressed. But George still had his biggest gun left.

"Will you let me call two of your overseers?" he asked.

"Sure," replied the P. A., who was a good fellow.

Here's what they told the P. A.:

"We don't know much about brushes, except how they wear, and Atlanta Brush Company Brushes outwear any we ever had."

"That's enough," said the P. A. "Get out your book, George."

ATLANTA BRUSH CO.

ATLANTA, GA.

ATLANTA BRUSH COMPANY

A BRUSH FOR EVERY TEXTILE NEED

Electric Scrubbing!

Helps Attract Good Workers and Aids Good Work

Gastonia, N. C. — Two of the Six Large Mills

Pawtucket, R. I. Manville-Jenckes Spinning Co.

"There is nothing that so demoralizes working men as a dirty shop," said Henry Ford in an interview. "A dirty shop drives away good men and attracts bad ones."

This is just as true in the textile field. The Manville-Jenckes Spinning Company, large employers of labor, with mills in the north and south, does much that is practical to maintain cleanliness.

This company, and more than three hundred other textile companies *insist* upon *Clean Floors*—obtained the only economical way—the *Finnell System of Electric Scrubbing.*

The Finnell System in these mills insures floor cleanliness. It does not depend on human hands which tire and shirk. There are no pails of dirty water slopped on the floor and mopped off. There is a constant stream of clean water for every square inch—and the constant pressure of eight powerful brushes.

Free Booklet and Folder

Write for complete description of the Finnell System. Or ask for a private showing of our motion picture film.

AMERICAN SCRUBBING EQUIPMENT SALES CO.

General Offices and Factories

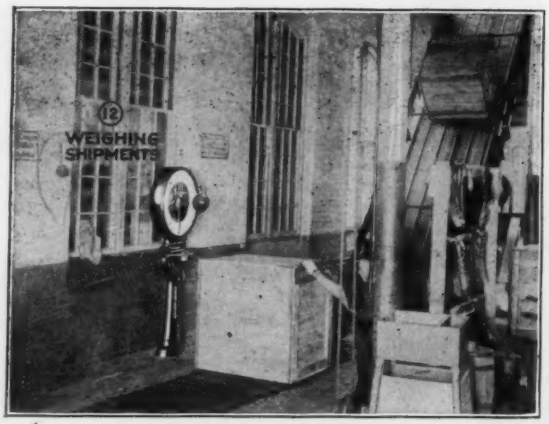
54 Collier Street Hannibal, Mo.

Power Scrubbing Headquarters for Seventeen Years

FINNELL SYSTEM

OF ELECTRIC SCRUBBING

"Clean Floors Reflect Clean Business"



Automatic Scales

For Weighing and Checking

Raw Material
Sorts
Soap, Alkali and Dyes
Balls and Sliver
Test Pieces

Tops
Laps
Bobbins
Roving

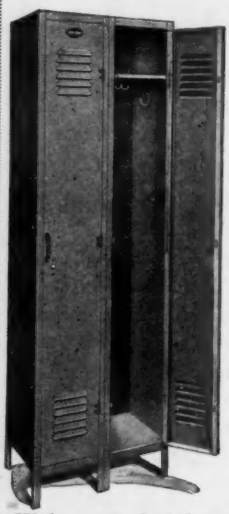
Yarn
Yardage
Section Beams
Shipments
And for many other purposes

Toledo Scale Company, Toledo, Ohio

Canadian Toledo Scale Co., Limited, Windsor, Ontario
Largest Automatic Scale Manufacturers in the World
106 Sales Room and Service Stations in the United States and Canada. Others in thirty-four foreign countries

"NO BETTER BUILT THAN DURABILT"

The slogan speaks for itself. The DURABILT Steel Locker is distinctively a Product of Quality.



Exclusive Features

1. Concealed, one-piece, automatic Latching Device.
2. Straight-lift, stamped-steel (not cast) Handle.
3. Five-knuckle, full-looped, double-wear "strap" Hinges.
4. Scientifically reinforced, rigid Door.
5. Extra heavy, countersunk riveted Door Frame.
6. Unusually large Ventilating Louvres.

We are also manufacturers of steel storage and wardrobe cabinets.

With our modern factory devoted EXCLUSIVELY to the manufacture of steel lockers and cabinets we are prepared to render unexcelled service on your requirments.

DURABILT STEEL LOCKER CO.
420 ARNOLD AVE. AURORA, ILL.

A Permanent Investment

Attractive
Sanitary
MILLS METAL
Economical

TOILET PARTITIONS
SHOWER STALLS
DRESSING ROOMS
SHELVING
TABLES
DOORS
BINS

"Mills Metal" Products are permanent investments, and their design makes them the most adaptable products of their kind for textile mill use.

"Slant Lip Diamond Rail Top and Bottom"

Constructed entirely of the highest quality rust-resisting steel. Finished in Olive Green or Gray Baked Enamel.

Write for bulletins.

THE MILLS COMPANY
Dept. A, Cleveland, Ohio

LOGEMANN BALING-PRESSES

For Waste—

Hand-operated Balers—
Deep-box power Balers—
Hydraulic Balers—

For Finished Goods—

Hand-operated Balers—
Power toggle-lever Balers—
Hydraulic high-density Balers—

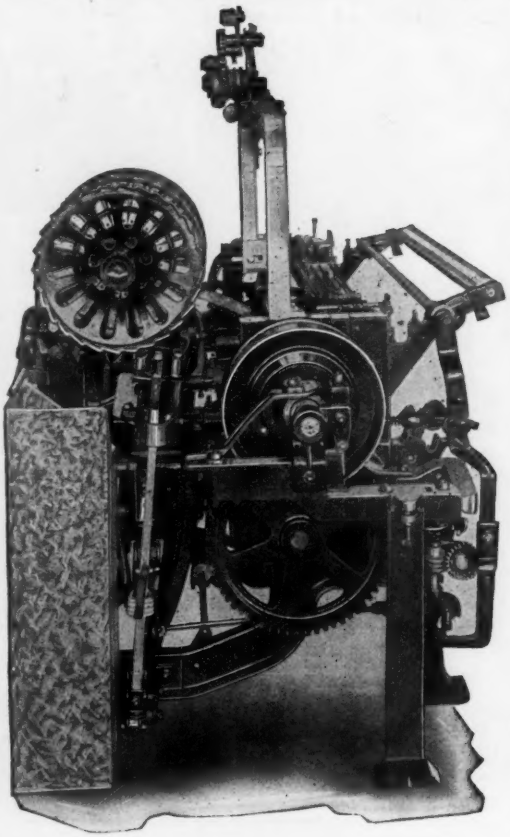
For Yarns—

High-density power Balers—

There is a LOGEMANN baler for every purpose.

Write for details specifying your needs.

LOGEMANN BROTHERS CO.
3102 BURLEIGH ST. MILWAUKEE, WIS.



The Latest

NORDRAY

Automatic Loom

Multiple-harness, Feeler type

built by

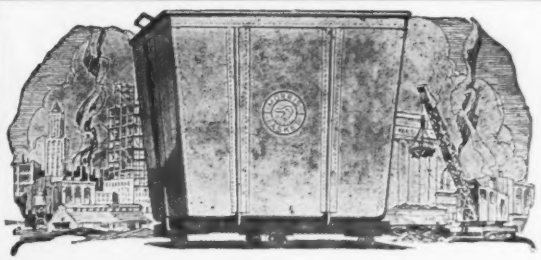
HOPEDALE MANUFACTURING CO.

at MILFORD, MASS.

SOUTHERN OFFICE at
GREENVILLE, S. C.

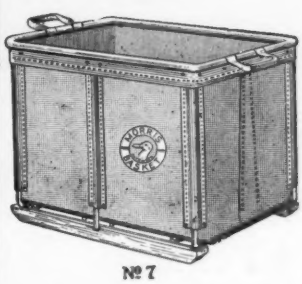
This loom was shown at the Late Greenville Exposition and excited great interest.

It is Still the Simplest.



The Economical Basket

Replacing short-lived baskets is expensive—and baskets that are ready for the junk pile cannot protect their loads.



Morris Duck Baskets are long-lasting baskets. They couldn't be otherwise for their reinforced frames are Round Spring Steel Heavy, durable, cotton duck is used for Coverings. Runners are supplied in either steel or wood.

№7

Name your requirement—there is a Morris Duck Basket to fill it. And its long and satisfactory service means a comfortable saving.

Supply houses and specialty Salesmen wanted to sell Morris Baskets. Write for detailed information.

An interesting booklet—and prices on request.

№19

MORRIS TRADE MARK PATENTED BASKET

MORRIS & CO., Inc.

15 Chestnut Street
GROVEVILLE, N. J.

MURDOCK
WATER SERVICE

DRINKING FOUNTAINS FOR FACTORIES—MILLS

"SANDOW" Self-closing Fountain — Bronze Bowl and Bubbler

Real water devices made for heavy duty service. FOOL-PROOF. Bubbler is adjustable to water pressure and affords a full soft bubble and a satisfying drink. A thin squirting stream is impossible.

Bubbler heads and stop cocks sold separately when wanted.

Outdoor Bubble Fonts for Playgrounds.

Yard Hydrants —Fire Hydrants

"HERCULES" Cast Brass Wall Fountain

Write for fully illustrated catalogues.

The Murdock Mfg. & Supply Co.
Cincinnati, Ohio.
Makers of Anti-freezing Water Devices since 1853

Satisfy Your Workman's Thirst—Sanitarily

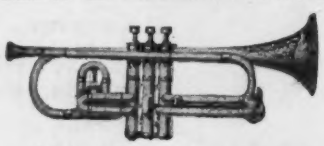
Keep your production up by keeping your workmen *fit*. Let them drink from R-S drinking fountains—satisfy their thirst and do it with Sanitary fountains.

R-S special design—a "vertico slant," eliminates every element of danger of disease. Besides, the water is kept cool, clear and fresh at all times.

Investigate R-S fountains. Write today for more information.

Rundle-Spence Mfg. Co.
57—4th St.
Milwaukee Wisconsin

R-S "Lips can't touch the R-S nozzle" R-S



A Band Helps to Make Contented Workmen

INDUSTRIAL bands are a great force for good—welding a body of employe's together, inspiring loyalty, providing amusement and recreation and actually speeding up production.

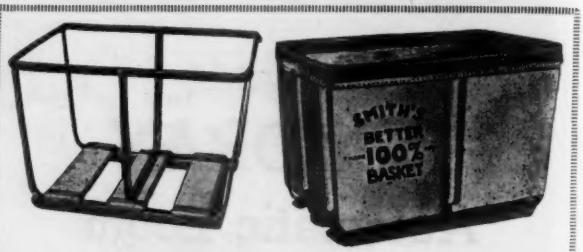
Conn will Help You Organize

We've helped to organize and have equipped hundreds of bands—our experience is at your service, without obligation. Conn instruments, easy to blow, beautiful in tone, perfect in scale, reliable in action—ideal for beginners as well as professionals.

JOHN PHILIP SOUSA *uses and endorses Conn instruments.*

Write today to

C. G. CONN, LTD.
515 Conn Bldg., Elkhart, Ind.



ECONOMICALLY Fill Your Needs

for the best doff baskets, storage baskets and distributor baskets. When they are apparently worn, slip on a new cover, and you have a basket as good as new.
The sturdy frame of SMITH'S 100% BASKETS is constructed of steel—practically indestructible—and has cross slats and skids of wood.
Light in weight, and rough handling does not affect SMITH'S 100% BETTER BASKETS They last a lifetime.

Want Prices?
Get in touch with us.

Smith Mfg. Company
Dalton, Ga.

SMITH'S TRADE 100% MARK BETTER BASKETS

"Yarn Saver" on Round Nose

"SONOCO"

"Yarn Saver" (Round Nose) Cones, and Convolute Tubes

Parallel Tubes, Cloth Winding Cores, Splicing Cones, etc.

Our "Yarn Saver" Cone is Sonoco-Surfaced to catch the yarn at the first lap of the winding and the round nose saves the knitter the last foot or more at the unwinding.

If we are not familiar with your requirements, send samples.
We also make the new Cushion Cone, with "Yarnsaver" nose.

Sonoco Products Co., Mfrs. **Main Office and Factory, Hartsville, S. C.**

Eastern Office 410 Olympia Bldg., New Bedford, Mass. Canadian Repr.: W. J. Westaway Co., Ltd., Hamilton, Ont.

Greater Strength Assured in the

ALLEN COMPANY OLD STYLE SECTION BEAM

IN the Old Style Section Beam shown above, shafts of rolled steel instead of soft steel as commonly supplied, is used, thus greater strength is insured. Inside heads milled and forced on shaft under great pressure. Staves secured to inner heads by screws, holes being bunged to insure smooth surface on barrel. May be used with any make of head. Can also be furnished with lengthwise stay bolts to hold the heads on.

Allen Company Products, tried under your own conditions, will prove profitable investments. Catalog showing the complete line gladly furnished on request. Ask for it today.

ALLEN COMPANY, NEW BEDFORD, MASS.

Also Manufacturers of

Wooden Beam Heads, Section Beams, Loom Beam Heads, Top Beams, Beam Trucks, Box Trucks, and other wooden specialties.

Southern Representative: Carolina Specialty Co., Charlotte, N. C.

Bobbins Spools Skewers
Tubes Rolls
Manufacturers and Enamelers

OUR CUSTOMERS SAY

The careful attention that we give to the manufacture of their requirements means a stronger and more reliable Bobbin for them, while to us it means repeat orders.

We put all styles of reinforcements on Bobbins and Spools for conditioning of yarns.

All Bobbins enameled by our own process.

OUR PRODUCTS WHATEVER YOU USE WE MAKE

For service and prompt attention write us.

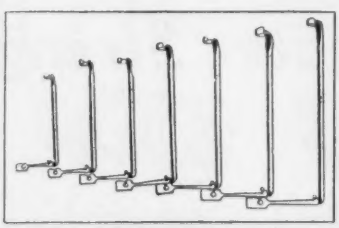
Walter L. Parker Co.
Lowell, Mass.

THIS Magazine is a product of our plant.

OF more interest to you however, is the fact that we are equipped to handle anything which you may need in the printing line. We make a specialty of the "Better Class of Blank Books and Mill Office Supplies."

THE
A. J. SHOWALTER CO.
Dalton, Georgia
"The House of Better Service and Prices"

Here They Are!



3 Ways Of Increasing PROFITS!

1. Do Not Neglect Your Machinery
Give it proper care! It needs constant watching! Have it gone over by experts at least once a year. Defective and loose parts may be found which need overhauling. A large number of mills employ us to make yearly inspection of their machinery. This keeps them in the highest state of efficiency and means increased production and decreased expense.

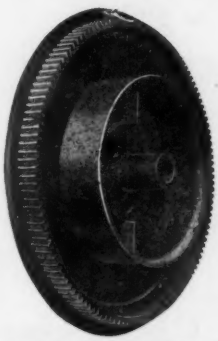
2. Worn or Broken Machines
Are often discarded when they can be repaired and made equally as good as new. The broken or worn part can be taken off and replaced. The complete machine can be rebuilt or overhauled. Our skillful mechanics can get renewed service out of your machinery for you.

3. Do Not Discard Broken Parts
Steel rolls can be renecked, stoned and honed for half the cost of new ones. Old spindles can be repointed, straightened and rehardened. Flyers, picker lap pins and cylinder heads can be repaired at a considerable saving.

Southern Spindle & Flyer Co., Inc.
"We Manufacture,
Overhaul and Repair Cotton Mill Machinery"
Charlotte, N. C.
W. H. MONTY, Pres. and Treas.
W. H. HUTCHINS, V. Pres. and Secy.

All Steel Loom and Section Beam Heads

Cannot Break
Do not Bend



"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
PATENT PENDING

"ALL STEEL" SECTION BEAM HEAD
PATENTED

"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

DUPLICATE YOUR CAST IRON HEAD IN STEEL—ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

Mossberg Pressed Steel Corporation

Attleboro, Mass.

Seven Points of Satisfaction

QUALITY is the watchword of the Williams' Organization, an appreciation of which is the basis of good judgment. Our ***WORKMANSHIP*** is of a superior class by experienced and contented workmen reflecting itself in the finished product. In the ***DESIGN*** of our shuttle is found a coordination of parts which mean strength and durability. Our automatic number 7 threader is ***EASILY THREADED*** and yet it is so constructed that we can make with every assurance the statement that it positively will ***NOT UNTHREAD.*** All of these points spell economy and to the progressive mill man these vital factors in the long run signify ***LOW COST.*** Finally, personal supervision, prompt deliveries and care in shipping of each and every individual order means ***SERVICE.***

The J. H. Williams Co.

"The Shuttle People"

MILLBURY MASS.

George F. Bahan, Southern Representative, Charlotte, N. C.

For those of you who did not attend the Textile Show

It was too bad that you missed the many new ideas and improvements that have been developed since the last show.

At "Shuttle Headquarters" for instance, there was an unusually interesting display of Shambow "Custom Built" Shuttles.

They created much favorable comment.

But, because you did not see them at the show is no reason why you shouldn't have an opportunity to see them.

We are prepared to send you a man who will show you shuttles and weaving devices of great interest to you. He is a Shuttle Engineer and should you require it, he is fully capable of redesigning your present shuttle or designing an entirely new model for you.

This expert service won't cost you a cent and may save you much money. Just sign and mail the coupon or write us.

Shambow Shuttle Company
Woonsocket, R. I.

JOHN C. SHAMBOW, Pres. & Treas. H. H. ULLMAN, V. Pres. & Gen. Mgr.

Philadelphia 42 431 Bulletin Bldg. Paterson, N. J. 245 Straight St. Greenville, S. C. Southern Factory

COUPON

SHAMBOW SHUTTLE CO., Woonsocket, R. I.

We will be interested to learn more about the new shuttles, tensions, threaders and other devices without obligating ourselves in any way.

Company .....

By .....

Address .....

.....

SHAMBOW MAKES

shuttle bills smaller
interruptions fewer
production greater
products better

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

Manufacturers of

LOOM HARNESS,
WEAVING REEDS,
OAK TANNED LEATHER
BELTING, STRAPPING,
ETC.

We make a specialty of Harness for Warp Drawing Machines

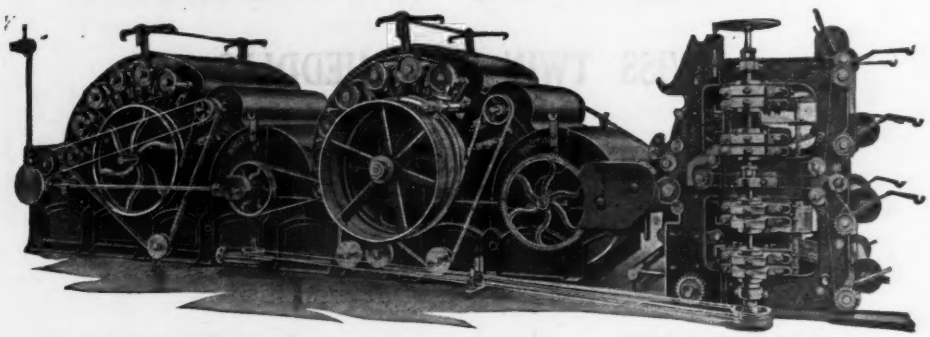
WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

MANUFACTURERS OF

Complete Condenser Plants for Wool and Cotton Waste Yarns



Intermediate and Finisher Cards With Four-Bank Condenser

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

We Manufacture—

LOOM REEDS

Heavy Duck and Fancy Reeds a Specialty

Also Sliding Hook and Double Bar

HEDDLE FRAMES

Made with Iron or Wood Ends

TWIN STEEL WIRE HEDDLES

With or without Inserted Eyes

Samples and Prices Furnished on Request.

WALKER MANUFACTURING CO., INC.

ESTABLISHED 1875

Kensington Ave. and Ontario St., Philadelphia, Pa.

Southern Office: 201 Augusta St., Greenville, S. C.

SELECT THE HEDDLES WHICH GIVE YOU SATISFACTION

A HEDDLE FOR EVERY PURPOSE

SWISS TWIN WIRE HEDDLES

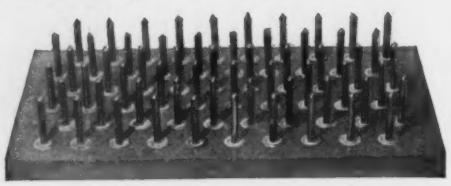
J. J. REUTLINGER

160 FIFTH AVE. NEW YORK

Southern Representative:
RALPH M. LANE,
P. O. Box 1375, CHARLOTTE, N. C.

Eastern Representative:
A. J. SCHULLER,
163 MERIDIAN ST., EAST BOSTON, MASS.

KORE-LOKT
REG. U. S. PAT. OFFICE
PIN BOARDS



Patent Rights Pending

Are You Responsible

for good weaving in your mill? If so, you should know Kore-Lokt Pin Boards and the story of their usefulness in modern loom equipment.

Expert Opinion from men in charge of the weave rooms in prominent mills is available to superintendents and overseers upon request.

Send for this information so you may know the merits of Washburn Kore-Lokt Pin Boards as an improvement over old style Filling Boxes. Learn how the other fellow checks up results from the "Build of Bobbins."

NEW BEDFORD, MASS.

PERFECTION SHELL ROLLS

FOR
BLEACHERIES
BALL WARPING
FINISHING PLANTS
CORD FABRIC SHIPMENTS

NEW BEDFORD, MASS.

Howard Bros. Mfg. Co.

ESTABLISHED 1866

Home Office and Factory, Worcester, Mass.

Southern Branch Factory — *121 South Forsyth St., Atlanta, Ga.*
Southern Branch Office — *1126 Healey Bldg., Atlanta, Ga.*
E. M. TERRYBERRY, Southern Agent — *G. L. MELCHOR, Asst.*

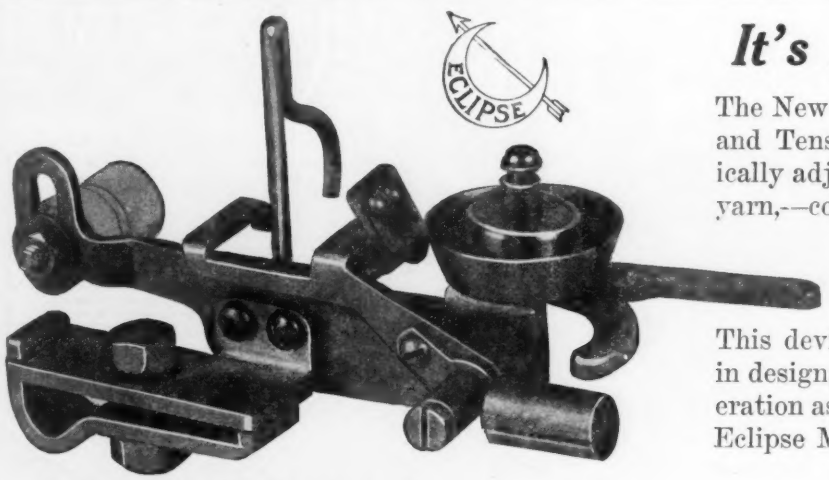
Cylinder and Doffer Fillets
Napper Clothing

Stripper and Burnisher Fillets
Emery Fillets

Top Flats and Lickerins Recovered and Promptly Returned

Tempered Steel Twin and Domestic Iron Wire Heddles
The Best Materials Obtainable Make Up Our Products

Give us a trial on Cylinder and Doffer Fillets. This will satisfy you as to the merits of our Card Clothing.



It's Automatic

The New Eclipse Slub Catcher and Tension Device automatically adjusts itself to any size yarn,—cotton wool or silk.

It is also self-threading.

This device is just as perfect in design, construction and operation as are the other famous Eclipse Machines.

May we send you full details and prices? Write today.

Eclipse Textile Devices, Inc.
Elmira, N. Y.
Makers of

Eclipse Automatic Yarn Cleaners
Eclipse Yarn Tension Device
Eclipse Automatic Stop Motions
Eclipse Random Dyeing Machines
Eclipse Van Ness

ECLIPSE

SLUB CATCHER AND TENSION DEVICE

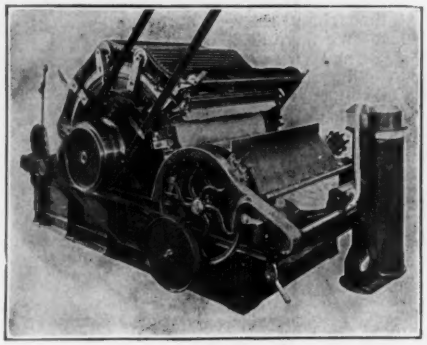
THE
WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.
SPINNING RING
SPECIALISTS
ESTABLISHED OVER FIFTY YEARS
DIAMOND FINISH

Cost
may be a primary consideration

The Liberty Knotter
not only fills the requirements of low first cost but is most simple in construction and economical in upkeep and operation. Give it a trial.
Guaranteed for one year
Write for information
A. B. CARTER, Sales Agent,
Gastonia, N. C.
Mill Devices Co. Durham, N. C.

Growth A Tribute To Worth
1883
THE reputation of our "Superior" quality products established forty years ago has been maintained through the years, until today our "High Grade" products are demanded and used by the leading textile mills throughout the entire country. The combined organizations at the main plant in Lawrence, Mass., together with three big stock plants in Maine, New Hampshire and Vermont, altogether operating hundreds of skilled workmen, each one of whom takes pride in upholding the reputation established forty years ago, assure textile mills of the most dependable and economical products of their kind to be obtained.
We specialize in complete new mill equipment of Bobbins, Spools, Shuttles, Skewers, etc.
Our "High Grade" Products include:—Plain and Automatic Loom Shuttles, Warp Bobbins, Filling Bobbins, Card Room Bobbins; Plain and Metal Head Warper and Twister Spools, Automatic Loom Bobbins, etc. We particularly call attention to our bobbins and spools fitted with our special metal shields of all types and kinds, also to our enamel finish in any color.
THE DAVID BROWN CO.
"High Grade" Bobbins, Spools and Shuttles
LAWRENCE, MASS.
1924
GOLD MEDAL
SILVER MEDAL
The David Brown Co.
Lawrence, Mass.

SACO-LOWELL
TEXTILE MACHINERY



INCLUDING

REVOLVING FLAT CARDS

Our cards are designed to meet the various conditions found in different mills and will handle all lengths of staple from the longest Sea Island to the shortest waste stock. Especial attention has been given also to the elimination of air drafts which cause the web to be cloudy.

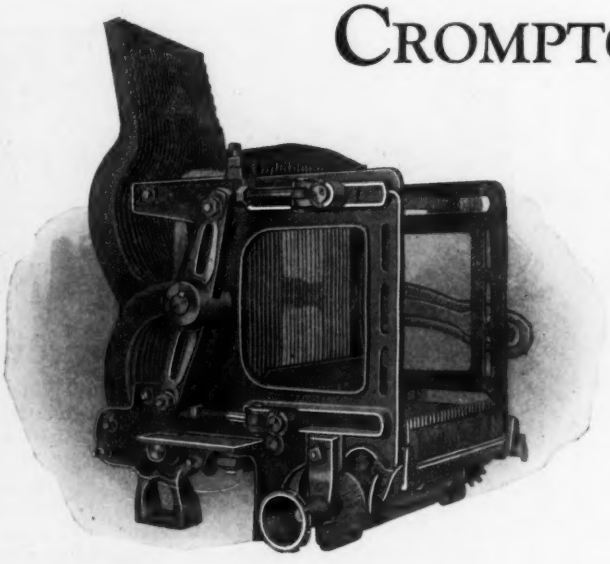
SACO-LOWELL SHOPS

SOUTHERN OFFICE
CHARLOTTE, N. C.

Branch Southern Office
Greenville, S. C.

Executive Offices:
NO. 1 FEDERAL ST.
BOSTON, MASS.

SHOPS
BIDDEFORD, ME.
LOWELL, MASS.
NEWTON UPPER FALLS, MASS.
PAWTUCKET, R. I.
CHARLOTTE, N. C.



CROMPTON & KNOWLES
DOBBIES

NEW FEATURES OF SPECIAL INTEREST TO WEAVERS AND FIXERS

1. We are now prepared to equip the dobby shown above with pressed steel hook levers (patented) and drop forged top and bottom hooks (patented).
2. Built with slotted fingers and locking rod (patented), making it easy to remove, clean, and replace the fingers.

We call attention to the carefully machined swivels and studs used for operating the dobby knives.

This dobby can be applied readily to any make or type of loom.

CROMPTON & KNOWLES LOOM WORKS
WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.

S. B. ALEXANDER, CHARLOTTE, N. C., Southern Manager.

A Real Service

Permanently Linked With the Interests of Southern Mills

For over a quarter of a century, the J. B. McCrary Company have been purveyors of progress and prosperity in civic improvement. We do not pose as public benefactors nor purveyors of charity, but believe in helping ourselves by adding to the welfare of humanity.

Our business is to act as engineers, architects, financiers, contractors and supply municipal improvements for cities, towns, small municipalities and mill villages. Our aim is to give the best possible service at the lowest possible cost and add to the health, wealth and happiness of the mill and its employees.

Our record throughout the Southern States is an open book. We have designed or built over 700 water, light and sewer systems for Southern communities and over 5000 miles of hard surface street paving and highways amounting to over Two Hundred Millions of Dollars.

Our operations are based on scientific experiences. Hazard, risk and uncertainty are eliminated. McCrary experienced service can be secured at a fraction of the cost you would have to pay through any other source.

Call on us or have your architects call us in conference when village improvements are under consideration.

The J. B. McCrary Co.

Engineers, Contractors **ATLANTA, GA.**

Waterworks, Sewers, Pavements, General Village Improvements.

Ware Paint Co.

Wood Preservatives, Stains, All color Metallic and Composition Paints

SAVE THE SURFACE WITH W WARE WEATHER PAINTS TRADE MARK REG.

Barn Paints, Roof Coating Roofing and Roofing Materials

Atlanta, Ga.

Defeats the Costly Ravages of Weather and Wear

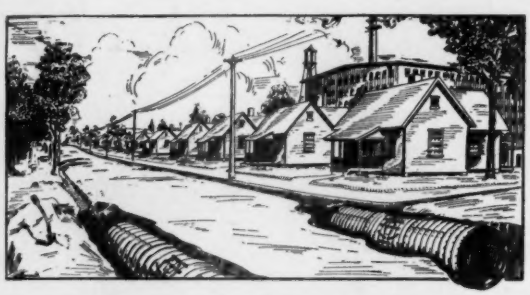
Makes all surfaces—wood, metal or composition — moisture proof; rust proof; rot proof.

Adds years of serviceable life to every part of the mill. Best of insurance against replacement or repair costs.

Used and recommended by Industrial Plants and Cotton Mills, everywhere.

Distributors of FLINTKOTE Roofing.

Our Application Department will be glad to give you estimates on applying new roofs. **Our Service Department at your call—any time—anywhere.**



Road Building for Tomorrow

Made of Keystone Copper Steel—a steel with a new endurance and rust-resistance—Carolina Metal Culverts meet every requirement of the State Highway Commission and the United States Government. They are made of the proper weight material by experienced workmen and are fabricated in any desired length. They stand the test of time and hard usage, whether in the highest grade road or in the country lane. Use Carolina Metal Culverts to guarantee low maintenance and long life. Use them in your Mill Village in "Road Building for Tomorrow."

LET OUR ENGINEERING DEPARTMENT SOLVE YOUR DRAINAGE PROBLEM

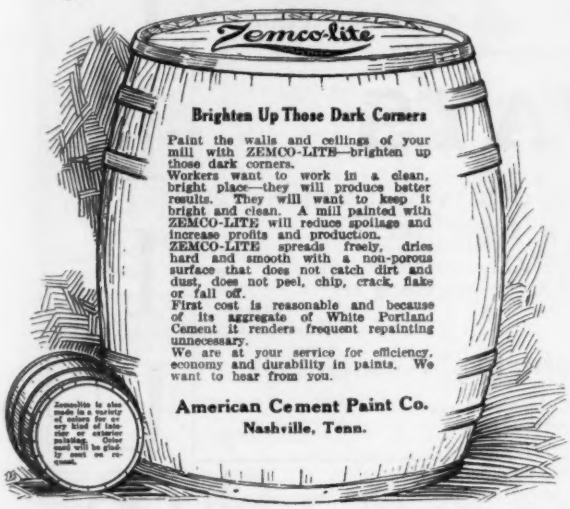
Carolina Metal Culvert Company

Office and Works

SALISBURY, NORTH CAROLINA

Zemco-lite

TRADE MARK


Zemco-lite
Brighten Up Those Dark Corners
Paint the walls and ceilings of your mill with ZEMCO-LITE—brighten up those dark corners.
Workers want to work in a clean, bright place—they will produce better results. They will want to keep it bright and clean. A mill painted with ZEMCO-LITE will reduce spoilage and increase profits and production.
ZEMCO-LITE spreads freely, dries hard and smooth with a non-porous surface that does not catch dirt and dust, does not peel, chip, crack, flake or fall off.
First cost is reasonable and because of its aggregate of White Portland Cement it renders frequent repainting unnecessary.
We are at your service for efficiency, economy and durability in paints. We want to hear from you.
American Cement Paint Co.
Nashville, Tenn.

The Cement Paint

102-30-10

Rain - Sun - Snow

It doesn't make any difference what kind of weather, a roof that can be depended upon is assured if it has been applied by

"Dixie's Reliable Roofers"

For over 42 years we have concentrated our efforts on roofing problems of all kinds. Our roofing experts are at your service in solving your problems, large or small

Here are a few of the textile mills whose roofing problems have been solved by our specialists and whose roofs have been "Done by Murphy."

BIBB MFG. CO.
COVINGTON COTTON MILLS
MILL NO. 2 NEWNAN COTTON MILLS
MILL NO. 1 ANCHOR DUCK MILLS
WINNSBORO MILLS
SCOTTDALE MILLS
HILLSIDE COTTON MILLS
MILL NO. 1 AND NO. 2 TALLADEGA MILLS
ROYAL MILLS

You will not regret calling on us for quotations.

Gravel and Slag Roofing
Waterproofing *Insulated Roofing*
Tar Concrete Floors

C. P. MURPHY'S SONS

Established 42 Years
ATLANTA, GA.

"Galv-After"

Chain Link FENCE FABRIC

CYCLONE "GALV-AFTER" CHAIN LINK FENCE FABRIC, HEAVILY ZINC-COATED (or Hot-Galvanized) by HOT DIPPING PROCESS *AFTER* WEAVING

Five times as much zinc coating as is applied to a ton of fence fabric galvanized **before** weaving. Result: "Galv-After" Chain Link Fence Fabric gives many years longer service without annual upkeep expense.

Let us send you complete information about this new and better fence, and Cyclone Service which solves any Fencing problem. Address nearest offices, Dept. 35.

CYCLONE FENCE CO.

Factories and Offices:

Waukegan, Ill.: Cleveland, Ohio; Newark, N. J.: Fort Worth, Texas; Oakland, Cal. (Standard Fence Co.); Portland, Ore. (Northwest Fence and Wire Works).

Cyclone Fence

PROPERTY PROTECTION PAYS.

The Mark of Quality — Cyclone "Red Tag" FENCE AND PRODUCTS — Fence and Service

TUPELO

For TEXTILE MILL FLOORS especially, this "Hard-Wear" Lumber makes good always—and in

ALL-WAYS

Wheels and heels have the effect of making it smoother and solider and denser. That's "some" merit.

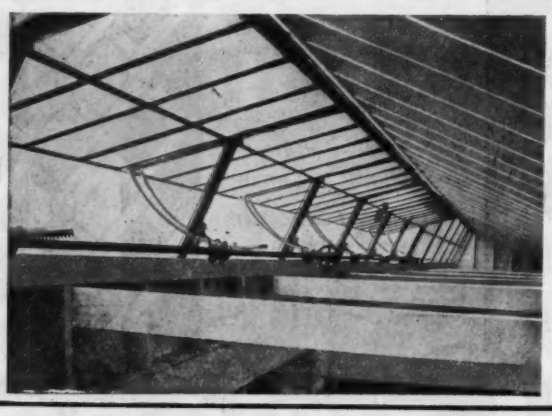
Get the complete facts about TUPELO before placing an order for Flooring for any use. They're interesting and convincing. Write.

Southern Cypress Manufacturers' Association

805 Poydras Building, New Orleans, La., or
805 Graham Building, Jacksonville, Fla.

TUPELO

GEORGE DOWMAN 610-611 Walton Bldg., Atlanta, Ga.



Better Ventilation

Plenty of fresh air without draft or dust is a wonderful stimulus to production. Both old and new buildings may be easily equipped with

Callahan Sash Operators

For any type of pivoted or hinged wood or steel sash. We have an Engineering Department that will work with you or your architect in the development of plans. Let us give you an estimate.

THE T. J. CALLAHAN CO.

804 S. Perry St. Dayton, Ohio

GEORGE DOWMAN 610-611 WALTON BLDG., ATLANTA, GA.

"DOWMAN SERVICE" IS KNOWN ALL OVER THE SOUTH. TAKE ADVANTAGE OF THIS SERVICE WHEN IN NEED OF ANY OF THE FOLLOWING:

FIRE PROOF DOORS
SOLID STEEL SASH
HOLLOW METAL WINDOWS
STEEL CASEMENTS
VENTILATORS
METAL CEILINGS
STEEL BUILDINGS
METAL LATH
STEEL FENCE
SASH OPERATORS
OVERHEAD CARRIERS
ETC.

SEND FOR CATALOGS AND PRICES

Southern Selling Agent for the Products on This Page—Quality Products plus "Dowman Service"

Principles!

Behind every product of merit is invariably found an organization living up to certain well defined principles.

Our product is SERVICE — trouble-proof electrical installation service—and in serving our clients we serve them as we would like to be served ourselves, we buy their supplies just as if we were spending our own money—and besides this personal interest, our knowledge of electrical equipment and our long years of experience in solving textile mill electrical problems, enables us to keep faith with definite principles of

Satisfaction and economy, first and last, on every installation, large or small

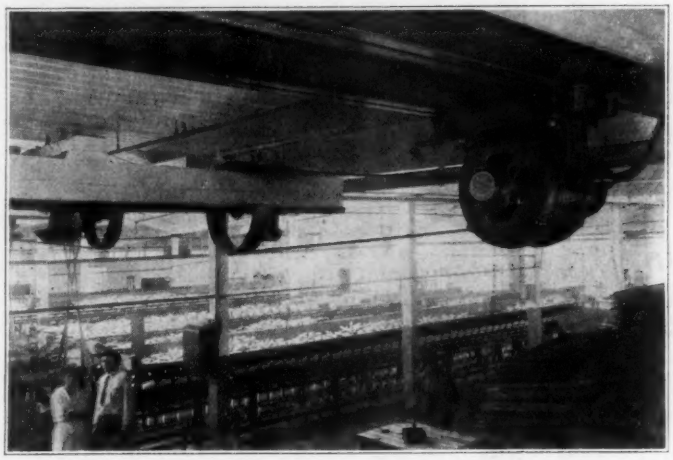
HUNTINGTON & GUERRY, INC.

GREENVILLE, S. C.

HUNTINGTON & GUERRY TROUBLE PROOF ELECTRICAL INSTALLATIONS

H & G TROUBLE-PROOF ELECTRICAL INSTALLATIONS

Textile Motors



30 H.P., 1200 R.P.M., Type "AR" Motor driving Winders.

ALLIS-CHALMERS Type "AR" Squirrel Cage Motors fit into every requirement of the Textile Industry.

They are designed for both horizontal and vertical drive.

Their steel frame construction makes for an extremely rugged motor.

Positive and efficient ventilation results in uniform temperatures, avoiding "hot spots" so deteriorating to insulation.

For more detailed information send for bulletin.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

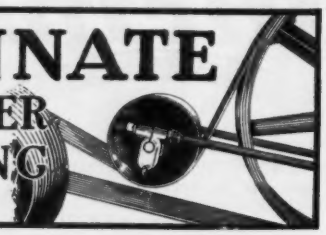
ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

District Offices in All Leading Cities.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

TANNATE LEATHER BELTING



A MILL owner says of his Tannate Belt, "I do not believe any load could make it slip. It has paid for itself twice over."

The unusual pull of Tannate is a big thing on your more difficult or more particular drives. For it means increased output and often better quality because of the steady even running of your machines.

It is output that counts, and Tannate Belts help you to maximum output. That is what this mill man means when he says the belt has paid for itself twice over .

J. E. RHOADS & SONS

PHILADELPHIA: 29 N. Sixth St. CHICAGO: 316 W. Randolph St.
NEW YORK: 96 Beekman St. ATLANTA: 67 S. Forsyth St.
Factory and Tannery: WILMINGTON, DEL.

Stretched Laps Make Poor Work

And with ordinary rollers in the lap heads on lappers, the lap rod is so hard to turn that the lap is stretched by pulling hard enough on it to cause it to turn. Ball bearing rollers can be put in your present heads in a few minutes at small cost. Send us an order, giving the kind of lap heads you are now using.

AldricH MachinE Ball WorkS Bearings

Greenwood, S. C.

Approximately 1,500,000 Barrels "Royal Cement" Shipped Into Southeastern States Last Year

DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN.

Is tested in our laboratory every 60 minutes. The quality of our product is only equaled by our service in the handling of large jobs.

DIXIE PORTLAND CEMENT CO.

CHATTANOOGA, TENN.

ELECTRICAL SUPPLIES

GENERAL ELECTRIC CO.'S PRODUCTS—MOTORS, WIRE, WIRING DEVICES, ELECTRICAL, PORCELAIN CONDUIT AND FITTINGS, TRUMBULL SWITCHES.

Complete Stocks in Columbia for Prompt Shipment.

DISTRIBUTING JOBBER

PERRY-MANN ELECTRIC COMPANY

COLUMBIA, S. C.

100% Lubrication for loose pulleys!

ORDINARY bushings fail on loose pulleys. They waste workers' time—must be oiled daily. They waste oil—spatter 90% of it off on machinery, belts and floor. Oil-soaked belts slip and rot; floors can't be kept clean.

Every loose pulley needs the Moccasin, a self-oiling bushing. Requires oiling only a few times a year. Its wood feeders filter the oil from reservoir to bearing surface . . . . . keep the oil free from grit. And only the exact amount of oil needed is filtered through the feeders—no waste—every drop of oil is used to lubricate—none can be spattered off.

In hundreds of mills, the Moccasin is now saving time, oil and equipment formerly lost through faulty lubrication.

Send for the Moccasin book of facts

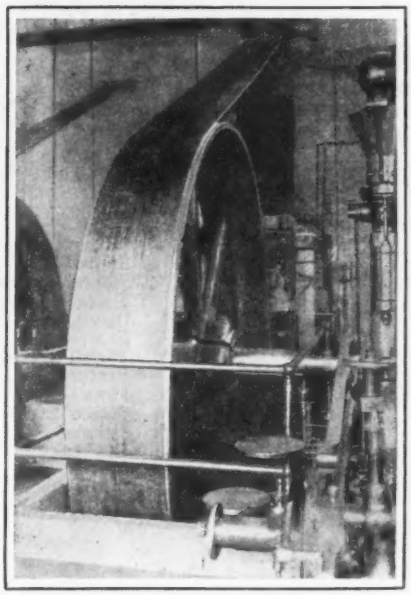
"We have been replacing all loose pulley bearings with Moccasin Bushings, and so far we do not have any more trouble with bushings, wearing out on account of want of oil."

Bethlehem Steel Co.

Learn how the "self-oiling" feature of the Moccasin insures 100% lubrication on loose pulleys; how the Moccasin is made, how it operates; and read the reports of mills that have eliminated oiling troubles by using the Moccasin. Write on your business letterhead "Send the book." It will reach you by return mail.

MOCCASIN BUSHING COMPANY
CHATTANOOGA, TENNESSEE

Nothing takes the place of Leather



They have paid for themselves several times

THE right belt in the right place. The right quality of leather, the right tanning methods, the right weight, flexibility and thickness to transmit the right amount of power—this is what the Graton and Knight Standardized Series of Belts means. And this is belting economy.

Out in the Middle West the manager of a large mill after making several severe tests with different sorts of belts decided to rebelt his entire mill with leather. Among the leather belts that were used for making the tests were some members of the Graton and Knight Standardized Series.

The Graton and Knight Belts stood the tests so much better than any of their competitors that they were chosen for the job.

And this is what the manager of the mill* wrote us some years later:

"Some of your belts have been running for several years and as they are in as good condition as when they were installed we are unable to give you any opinion as to the length of service we will get out of them, but at this time we are convinced that they have paid for themselves several times."

Send for the book "The Standardization of Belting," and at the same time let us know the type of power transmission you are most interested in. This book tells how, through constant study and analyzation of transmission problems, we have developed a series of belts to meet every condition.

We will gladly have a Graton and Knight engineer call upon you and place at your disposal one of the widest belting experiences in the world.

*Name upon request.

GRATON & KNIGHT
WORCESTER, MASS.

GRATON & KNIGHT

Electrical Service to Georgia

On General Electric Products

Our Atlanta and Savannah warehouses carry complete lines. Whatever your requirements — just so they are electrical— we can not only fill them, but insure prompt and efficient shipments.

We carry a particularly full line of textile mill equipment, illuminating units, lamps, motors, etc. Save yourself worry and inconvenience by drawing from our complete stock.

COMPLETE LINES OF

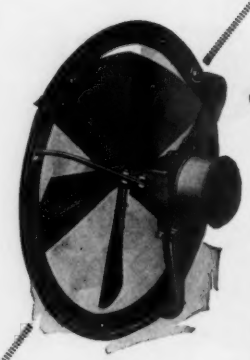
Wire
Conduit
Switches
Safety Devices
Fuses
Insulators
Lamps
Lighting Units
Fixtures
Fans
Street Lights
Motors
Brushes
Etc.
Anything Electrical

QUICK DELIVERY

CARTER ELECTRIC CO.

Distributors

ATLANTA SAVANNAH



"Buffalo" Pulley Disc Fans (Simplex)

each have two large, ring-oiling, bronze bushed bearings — both on the inside of the fan—no reaching through the wheel to oil the outer bearing.

Blades are of steel and perfectly balanced.

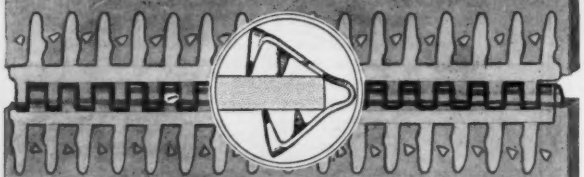
Send for Catalog No. 860-97 concerning all sizes

BUFFALO FORGE COMPANY
188 Mortimer St. Buffalo, N. Y.

ALLIGATOR

TRADE MARK REG. U. S. PAT. OFFICE

STEEL BELT LACING



The Metal Hinge Pins

The sectional steel rocker hinge pins slip into the completed joint and are held in place by lugs. They rock back-to-back making a practically frictionless bearing. Easily pushed out when necessary to lengthen or shorten belt.

The strongest belt lacing on earth. "Only a Hammer To Apply It." Sold by leading wholesalers and retailers, the world over.

FLEXIBLE STEEL LACING CO.
4619 Lexington St., Chicago, U. S. A.
In England at 135 Finsbury Pave., London, E.C.2

"Every Tooth A Vise"

For Every Size and Kind of Belt

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also precede merit as surely in machinery as in men.

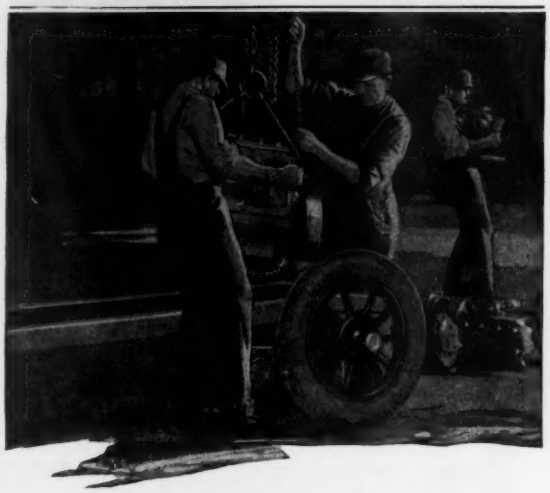
Time, skill and effort must also precede merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY
ENGINEERS—FOUNDERS—MACHINISTS
PHILADELPHIA, PENNA.

CYCLONE HOISTS
HIGH SPEED



A 350 lb. lift every 2 minutes

IN a certain Pittsburgh automobile assembly plant a Cyclone Hoist lifts a 350 lb. motor every two minutes throughout an 8 hour working day.

When we saw it in action it had been working steadily at this rate for 2 years.

It explains why hundreds of Cyclone Hoists have been sold to this automobile manufacturer.

It's clinching proof, too, why you should say Cyclones, when you next order chain hoists for your plant.

Distributors Everywhere. Send for catalog covering 1 to 40 Ton Hoists, Cranes, Trolleys, and Overhead Track Systems.

The Chisholm-Moore Mfg. Co.
Cleveland, O.

Hoists Cranes Trolleys
Overhead Track Systems

Branches: **New York, Chicago, Pittsburgh**

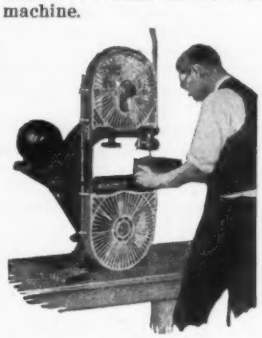
Taking the "Hack" Out of Hack Saw

Racine High Speed Metal Cutting Machines have taken the "Hack" out of Hack Saw. They cut with a scientific draw stroke. The positive lift prevents any possibility of the saw dragging on the non-cutting stroke. Blades stay sharp and last ten times as long. Cuts are clean; no special attention is required to work to 0.01 inch limits.

There is a Racine H. S. Metal cutting machine for every metal cutting requirement.

Racine High Speed Metal Cutting Machines

Cut more accurately, much faster and at far less cost than any other machines on the market. Send for a sample from six-inch stock and see the accurate work done on this scientifically designed cufting machine.



RACINE DUPLEX BAND SAW

Built to cut every material, wood, soft metal or steel. Two speeds, ball-bearing mounted wheels are vibrationless, — saws will not crystallize, a machine that is cutting costs for dozens of manufacturers. Let us send you our bulletin—better yet, arrange for a demonstration.

Use "Racine" H. S. Wood and Metal Band Saw Blades and "Racine" H. S. Tungsten Power and Hand Hack Saw Blades.

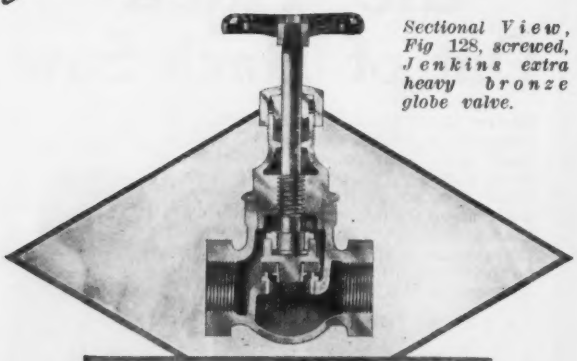
RACINE TOOL & MACHINE CO.
1309 JONES AVE., RACINE, WIS.

"STANDARD THE WORLD OVER"

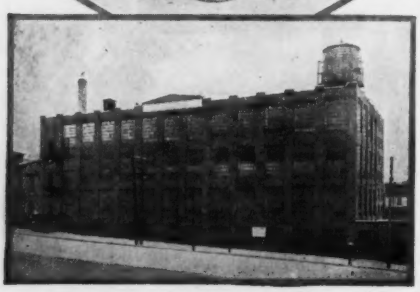
Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros



Sectional View, Fig 128, screwed, Jenkins extra heavy bronze globe valve.



The mill of Fred Pearson & Co., Inc., manufacturer of cotton and plush goods. Manyunk, Pa. Mr. W. E N. Dyer, mill engineer and architect, Philadelphia, Pa.

Jenkins Valves—the choice of this and many other mills

Fig. 293. Angle, flanged, Jenkins Extra Heavy Iron Body Automatic Equalizing Stop and Check (Non-return Valve for boiler protection.

Fred Pearson & Co., Inc., and hundreds of other mills are relying upon Jenkins Valves for helping to get the best results from their power plants, plumbing and heating systems.

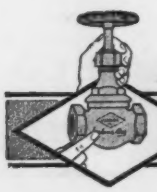
It pays to use Jenkins Valves only—they are well built for wear and hard usage. All parts are made heavy and strong—nothing is skimped. Then, too, Jenkins Valves stand up year-in and year-out under the hardest conditions. They keep on giving good service from the day they are put in.

Many mills realize the importance of this. They appreciate the service only genuine Jenkins Valves can give; and are therefore like Fred Pearson & Co., Inc., standardizing on Jenkins throughout.

Jenkins Valves are supplied for practically all valve requirements. At mill supply houses everywhere.

JENKINS BROS.

80 White Street.....New York, N. Y.
524 Atlantic Avenue.....Boston, Mass.
133 No. Seventh Street....Philadelphia, Pa.
646 Washington Boulevard.....Chicago, Ill.



Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

LUNKENHEIMER

"Ferrenewo" and "Renewo" Valves

with renewable Nickel Disc and Seat

Fig. 1021
Iron Body "Ferrenewo" Globe
150 lbs. pressure

The Bronze "Renewo" for the higher pressure and temperature lines, and the Iron Body "Ferrenewo" for the lower, form a combination which offers manifold advantages and warrant standardization throughout any plant.

In both Valves the seating surfaces are regrindable, all parts including the nickel seat and disc are renewable, the materials have great wear resisting qualities and offer a large factor of safety, and all other features necessary for the maximum economy of maintenance, service and durability, are common to both Valves.

Bronze "Renewo" Globe
Fig. 73—200 lbs. pressure
Fig. 16—300 lbs. pressure

THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD
NEW YORK CHICAGO CINCINNATI, U.S.A. BOSTON
EXPORT DEPT. 458-460 LAFAYETTE ST. NEW YORK

Detailed information is given in Catalog 58-AK. Write for a copy.

102-30-10

TRADE LOCKE MARK

Established in 1871

LOCKE COMBINATION

PRESSURE REGULATOR

The "Locke" Combination Regulator is the only regulator that is capable of controlling the pressure in large pipes, as heretofore the friction and power required to move the valves were sufficient to defeat all efforts at close regulation.

Indispensable for controlling large valves at the slightest variation of pressure.

Especially adapted for—
Controlling blower engines for forced draft.

No amount of resistance caused by dirt or friction will interfere with its close regulation.

It is also especially adapted for high pressure work and is the closest working pressure regulator we manufacture. It has been found impossible to construct these regulators in a compact form, as the heat in and about the large steam pipes soon works destruction to all the delicate regulating mechanism. For this reason the regulator proper is constructed so that it can be set at a distance from the valve, usually on the wall beyond the reach of this destructive agency. It will be found that this arrangement is indispensable, as has been fully demonstrated by trial.

The valve is so constructed that it will not only act as a reducing valve but will keep a guard over its source of supply and if boiler pressure should be reduced below a certain point it will close the valve no matter how great the demand is for steam. It will again open when pressure rises above this certain point, again resuming its duty as a regulator.

LOCKE REGULATOR CO., Salem, Mass.

Southern Representative: J. C. Lydon, 907 S. Tryon St., Charlotte, N. C.

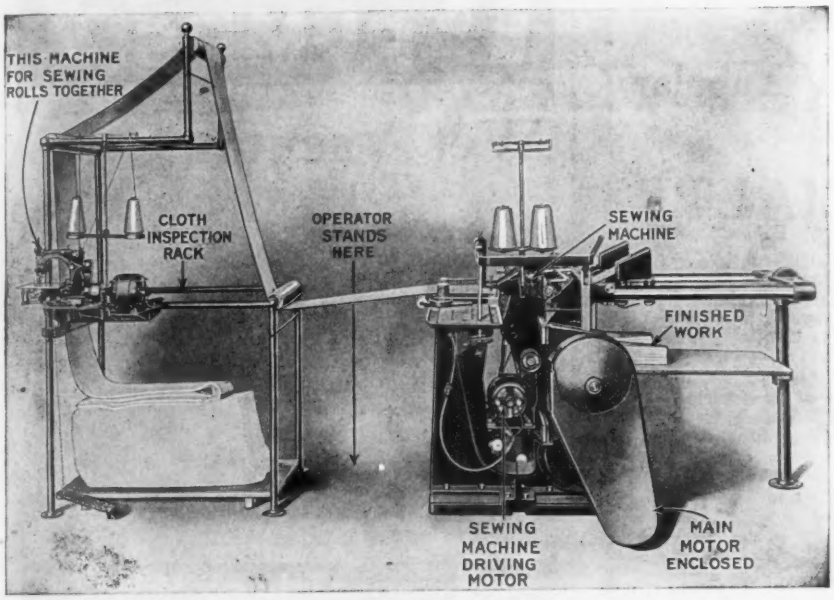
New York Representatives: Rowland & Burns, 39 Cortlandt St.

No other Agency or Representative in New York City.

THE JOHNSON FRICTION CLUTCH

in a No. 2 SINGLE SIZE is used on the Main Motor drive shaft enclosed of

THE WEIS AUTOMATIC DESIGN CUTTING AND SEWING MACHINE



COURTESY METROPOLITAN SEWING MACHINE CORP., NYACK, N. Y.

"We intend to use them right along—as they have proven very satisfactory."

Statements like the above coming from the Metropolitan Sewing Machine Corp. proves that the JOHNSON FRICTION CLUTCH is especially adapted to Textile Machinery.

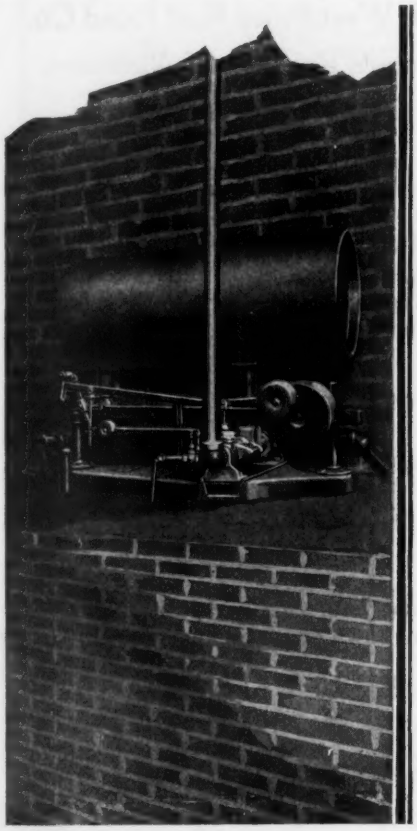
All Textile Machinery—spinning frames, twisters, cards, looms—no matter whether it is driven from lineshaft or by individual motor, will give highest efficiency when controlled by JOHNSON CLUTCHES. Small and compact. Smooth exterior; no accidents. Smooth operation; no jar or jerk.

Single Clutch with Pulley

Standard sizes carried in stock for immediate shipment.

WRITE FOR CATALOG "G."

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.



Perfect Drainage Cuts Operating Costs

Fuel bills climb as condensation collects in your slashers, dryers, dye cans and service heaters. Steam circulation becomes sluggish, the equipment is cooled, production drops.

Drain the condensation with a Morehead Back-to-Boiler System and these troubles will end. Steam will circulate freely, the interior surfaces will be dry and temperatures will jump to where they should be. Every pound of coal will do its complete job.

The hot condensate can be automatically fed to the boilers as feed water, saving the heat units above 212° and the steam used by pumps.

Morehead steam drainage specialists will gladly confer with you on any drainage problem. Write.

Morehead Manufacturing Company
Dept. C
DETROIT MICHIGAN
(125)

Morehead
"BACK-TO-BOILER-SYSTEM"
POSITIVELY DRAINS ALL TYPES OF STEAM APPARATUS, DELIVERS CONDENSATION AND FEED WATER TO BOILERS UNDER ALL CONDITIONS AT MAXIMUM TEMPERATURE

BOILERS

of the

Water Tube and Tubular Types

OUR SPECIALTY

WALSH & WEIDNER BOILERS with our improved Steel Casing make the ideal Steam Plant. The cost of installation is moderate, the plant looks neat, cost of repairs is slight and they will save from 10 to 25% of your fuel bill.

We also manufacture Tanks of all description, Towers and Tanks, Steel Stacks, Steel Breeching, Smokestacks, Structural Steel and Plate Steel Work.

Write for our new catalog.

The Walsh & Weidner Boiler Co.

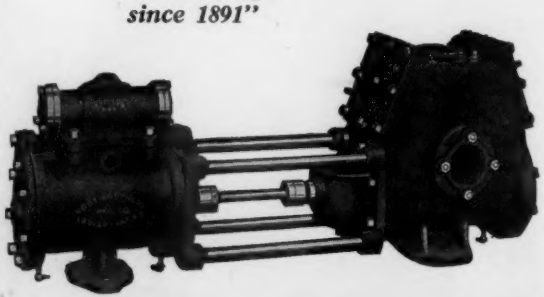
CHATTANOOGA, TENN.

New York Chicago San Francisco Memphis Havana
Kansas City Jacksonville New Orleans

REILLY PUMPS

Wet Vacuum Type

"Good Pumps since 1891"



VOGT BROTHERS MFG. CO.
(NATIONAL FOUNDRY & MACHINE CO.)
INCORPORATED
LOUISVILLE. KENTUCKY.

SERVICE TO BIRMINGHAM, MEMPHIS and the WEST

via

SEABOARD

Leave Atlanta	7:00 AM.	4:40 PM.	11:40 PM.
Arr. Birmingham	12:45 PM.	10:25 PM.	*6:15 AM.
Arrive Memphis		7:40 AM.	

*Remain in sleepers until 7:30 AM.

Thru daily sleepers on 4:40 PM. train from Atlanta to Memphis. Parlor cars to Birmingham. Dining car service unexcelled. For information or Pullman reservations, call on nearest SEABOARD Ticket Agent, or write

FRED GEISSLER

Asst. Passenger Traffic Manager, SAL Ry.,
502 C&S BANK BLDG. ATLANTA, GA.

Atlanta & West Point Rail Road Co.
The Western Railway of Alabama
Georgia Railroad

It should be of interest to the traveling public to know that we can now offer round-trip tourist tickets to all parts of the country at reduced rates, carrying with them liberal privileges of stop-overs and limits. Tickets are available to points in—

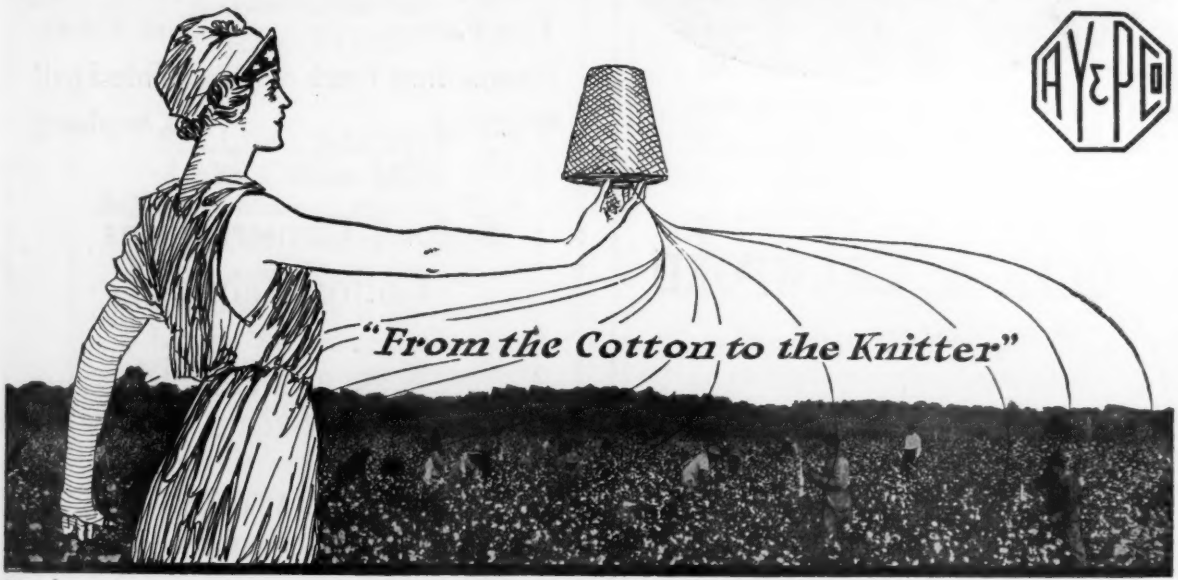
Alabama	Louisiana	Ohio
Arizona	Kentucky	Oregon
Arkansas	Mexico	Pennsylvania
British Columbia	Michigan	South Carolina
California	Minnesota	Tennessee
Cuba	Mississippi	Texas
Florida	New Jersey	Virginia
Georgia	New Mexico	Washington
Indiana	North Carolina	West Virginia

For further information, apply to Ticket Agent in your town or to the undersigned.

J. P. BILLUPS, G. P. A.,

120 EAST HUNTER ST. ATLANTA, GA.

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.



AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C.

Representatives

H. B. ROBIE, 346 Broadway, New York City

FORREST BROS., Forrest Bldg., Philadelphia

Weimar Bros.

Phone Connections

Works, 2046-48 Amber Street,

PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

HUGHES FAWCETT

IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes.

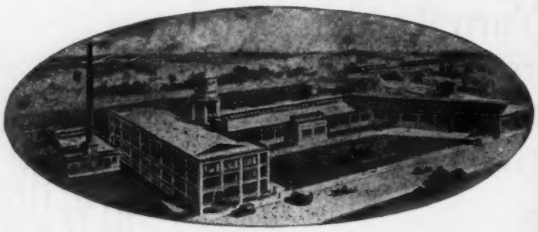
TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

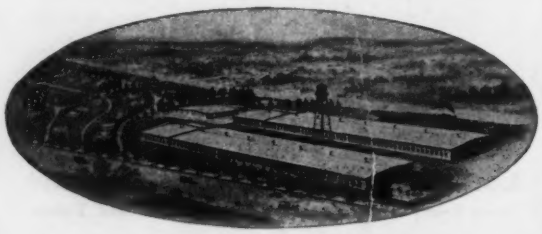
Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

"From the Cotton Field Direct to You"

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

J.H. LANE & CO.

Tire Fabrics — Cord Fabric
Enamelling Duck — Wide Drill
Sheeting — Osnaburg

Special Constructions
Cotton Fabrics

250 W. 57th St.
NEW YORK

225 West Adams St.
CHICAGO

F. W. LAFRENTZ & CO.

PUBLIC ACCOUNTANTS
100 Broadway, New York City

BRANCHES

New York	Baltimore	Los Angeles
Richmond	Milwaukee	Atlanta
Washington, D. C.	Boston	Philadelphia
Chicago	New Orleans	Scranton
Wilkes Barre	London, England	

Our reports of audit and our certificates on condition and operations are known and have weight in the financial centers of the world.

Atlanta Branch:
1013 FOURTH NATIONAL BANK BUILDING,
ATLANTA, GEORGIA
F. W. LAFRENTZ, C.P.A., (N.Y.) A. F. LAFRENTZ, C.P.A., (N. Y.)
C. B. BIDWELL, C.P.A. (GA.), Resident Partner

MOSS-McDUFFIE & CO.

COMMISSION MERCHANTS
Akron, Ohio

THIS concern is at all times in touch with a big demand for Osnaburgs, Sheetings and Ducks and their services are offered to a few more Southern Mills.

We can render unusual marketing service and will assure the right mills of a constant and direct contact with a large, favorable market.

References furnished.

Correspondence Invited

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

SELLING AGENTS
Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills
Athens Manufacturing Co.

Boston Representative
M. R. ABBOTT,
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

Akron Representative
LAWRENCE A. WATTS, Second National Building

J. B. JAMIESON CO.

77 SUMMER ST.

BOSTON MASS.

Commission Merchants

COTTON YARNS

of all descriptions for weaving and knitting.

We solicit accounts.

Wire or write us any offerings.

Time Proven Quality, In Cotton Yarns

For a quarter of a century we have been spinning good cotton yarns whose strength, uniformity, cleanliness and better weaving qualities can be vouched for by some of the country's best known manufacturers of textile products.

26 to 40s Carded — *Skeins, Warps*
50 to 60s Combed — *Cones, Tubes*

Lenoir Cotton Mills
Hudson Cotton Mfg. Co
Whitnel Cotton Mill Co.
Moore Cotton Mill Co.
Nelson Cotton Mill Co.

Address inquiries to the main office

LENOIR, NORTH CAROLINA

J. L. NELSON, *Treasurer*
J. L. NELSON, JR., *Assistant Treasurer*

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER
EDGAR H. BRIGHT
J. WILLIAM BARKDULL
C. MORGAN ABRAMS

MEMBERS OF
New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

CLASSIFIED ADVERTISING

RATES

DISPLAYED.

"For Sale" and all other advertisements using bold face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address.)

POSITION WANTED—Supt. of wide experience will be open for engagement June 15th, one who has been under Eastern managed mills for the past 7 years. Have wide experience on tire and other fabrics, as well as yarn. Married; have family. Don't move often. Age 38. Address "Southerner," care "COTTON," Grant Bldg., Atlanta, Ga.

WANTED—Position as Assistant Superintendent. Young man 29 years age, single, overseer Carding, Cotton Man, Textile Engineer, ten years practical experience. Best of references. Address Box 111, care COTTON, Atlanta, Ga.

Managerial Positions

Men with sales, technical or executive ability, capable of earning $2,000.00 to $50,000,00 desiring positions, in any locality should write us. Not a school nor Employment Bureau, but a safe confidential and logical way to obtain vacancies. The Murray E. Hill Company, 301 Chamber of Commerce, Nashville, Tenn.

FOR SALE

At a big sacrifice.

Complete small yarn mill, consisting of picker and finisher lappers, 12 Cards, 4 Drawing Frames, 3 Slubbers, 6 Spinning Frames. Complete with bobbins. All in fine working order. Can be seen on mill floor. Must be moved within 30 days to make room for other business.

F. W. LANGE

Box 188 Memphis, Tennessee

FOR SALE

2—H. & B. American Machine Company Combination Breaker Pickers, each comprising one No. 4 Patent Hopper Feeder, one Bladed Beater 18" diameter, one Cage Section and Lap Head.

1—Atherton Combination Breaker Picker as above.

1—Exhaust Fan, Overhead Condenser and Lattice Conveyor for 5 Mixing Bins.

All in first-class condition, now running, and can be seen in full operation.

Address

Box 112, care of COTTON

Grant Bldg. Atlanta, Ga.

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.,

Philadelphia, - Pennsylvania

To the President or Treasurer of a Large Cotton Mill.

I am seeking a larger responsibility and a broader opportunity—a position in which through endeavor and achievement, I can take over the cotton problem of a large mill or chain of mills.

I am qualified by education, hard won experience, tact and judgment to assume the buying of cotton, weighing and classing of same. I am equipped through experience to render the kind of service which will be profitable to a mill.

At present I am employed by a mill using about 9000 bales of cotton per year. I am therefore not a job hunter, but intent upon wider opportunity and heavier responsibilities.

Your reply will be held in confidence.

Address 486-Y c/o COTTON, Grant Building Atlanta, Ga.

WANTED

Experienced Paint Representative

A large well-known paint manufacturer desires a representative to handle their sales among the Southern textile mills. Must be a man with experience in selling paint to the textile mills, and one with ability to manage business in the Southern territory. Remuneration will be more than satisfactory. State full qualifications in first letter.

Address Box W. J. R., c/o COTTON, 1020 Grant Building, Atlanta, Ga.

I Want A Position In a Southern Mill

Have been in the mill for eighteen years, and have been overseer of carding for eight years.

At present I am overseer in a fine combed yarn mill making yarns of very good quality.

I am in New England, however, and the conditions do not suit me.

Am an American, 35 years of age, and will furnish satisfactory references.

Will take the place of overseer in a large mill, or would like superintendency of a small plant, more preferably a combed yarn proposition.

If you need a man of this kind, address

Box 109,

Care COTTON,

Grant Bldg., Atlanta, Ga.

VOGEL
PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

- Enameled Roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat.
- Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO
WILMINGTON
DELAWARE

JACOBS & COMPANY

SPECIAL ADVERTISING AGENTS

PRINTERS
DESIGNERS
PHOTO-ENGRAVERS
ELECTROTYPERS

Catalogues — a Specialty

HOME OFFICE:
CLINTON, S.C.

Tanks That Outlast Steel

A wooden tank made right of the right materials will outlast any steel tank made, especially when they are used for handling acids, hot oils, paints, dyes, soaps, etc.

Our many years of experience in the manufacture of tanks assures you the greatest efficiency and long life possible in

HIGHTOWER
Cypress
WOODEN TANKS

They are made from heart cypress stock thoroughly seasoned and reinforced. In addition to rectangular tanks, Hightower Tanks are made in a complete line of round tanks equipped with round iron hoops and malleable draw lugs.

For perfect satisfaction and maximum economy in tanks, insist on HIGHTOWER Quality. Ask for quotations on any size.

HIGHTOWER BOX & TANK COMPANY

ATLANTA, GA.
BIRMINGHAM, ALA.

Buyers' Index

ACETYLENE GENERATING APPARATUS.
Oxweld Acetylene Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuffs and Chemicals.)

ACCOUNTANTS.
Ernst & Ernst.
La Frentz & Co., F. W.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

AERATING AND CLEANING MACHINE.
Murray Co., The.

AIR WASHERS.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS
(See Humidifying Apparatus.)

ALBONE.
Roesler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Finishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

APRONS—RUB.
Bond Co., Chas.

ARCHITECTS AND ENGINEERS.
Dallis, Park A.
Lockwood, Greene & Co.
McCrary Co., J. B.
Robert & Co.
Stirrine, J. E.

ARMATURE REWINDING.
(See Repairing—Electrical.)

ARTWORK.
Jacobs & Co.

ASH HANDLING MACHINERY.
(See Coal and Ash Handing Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

AUDITORS AND ACCOUNTANTS.
Ernst & Ernst.
La Frentz & Co., F. W.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Regulators.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Phila. Drying Mchy. Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Whitin Mch. Works.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

AWNINGS.
Smith Mfg. Co.

BABBITT METAL.
Ryerson & Son, Inc., Jos. T.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAGS (COTTON PICKER).
Smith Mfg. Co.

BAGS (COIN OR MONEY).
Smith Mfg. Co.

BAGS (COAL).
(Smith Mfg. Co.

BALL BEARINGS.
Aldrich Mch. Works.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Machine Works.
Fafnir Bearing Co.
Fulton Supply Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strappings & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Logemann Bros.
Saco-Lowell Shops.

BALING PRESSES.
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES
Foster Machine Co.
Whitin Mch. Wks.

BANDS.
(See Tapes.)

BANKS.
American Trust Co.

BARS (IRON AND STEEL).
Ryerson & Son, Inc., Jos. T.

BAROMETERS.
Taylor Instrument Co.

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Durable Steel Locker Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Allen Co.
Mossberg Pressed Steel Corp.
U S Bobbin & Shuttle Co.

BEAM HEADS.
Allen Co.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U S Bobbin & Shuttle Co.

BEAMS (STEEL).
Ryerson & Son, Inc., Jos. T.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Aldrich Machine Works.
Cresson-Morris Co.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Moccasin Bushing Co.
Ryerson & Son, Inc., Jos. T.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Fulton Supply Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELTING—CHAIN.
Diamond Chain & Mfg. Co.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.

BELTING (ROUND—LEATHER).
Bond Co., Chas.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Dodge Mfg. Co.
Fulton Supply Co.
Link Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas .
Dixon Crucible Co., Jos. .
Fulton Bag & Cotton Mills.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT FASTENERS.
Detroit Belt Lacer Co.
Flexible Steel Lacing Co.
Fulton Supply Co.

BELT LACING (LEATHER).
Bond Co., Chas.
Dodge Mfg. Co.
Fulton Supply Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT TIGHTENERS.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Rhoads & Sons, J. E.

BELT TIGHTENER DEVICE FOR CONE PICKERS.
Bahan Textile Mch. Co.

BENCHES MECHANICS' CLOTH ETC.
Allen Co.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BINS (METAL).
Mills Co.

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS.
American Blower Co.
Buffalo Forge Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Westinghouse Elec. & Mfg. Co.

BLOWPIPES (BRAZING, CUTTING, WELDING).
Oxweld Acetylene Co.

BOBBINS.
Brown Co., David.
Draper Corporation.
Fulton Supply Co.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Parker Co., Walter L.
Shambow Shuttle Co.
U S Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Brown Co., David.
Jordan Mfg. Co.
U S Bobbin & Shuttle Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.
Terrell Machine Co.

BOILERS.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Toomey, Frank.
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
Hungerford & Terry, Inc.

BOILER ROOM FITTINGS AND SUPPLIES.
American Blower Co.
Crane Co.
Dixon Crucible Co., Jos.
Fulton Supply Co.
International Engineering Co.
Jenkins Bros.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOILER TUBES AND FITTINGS.
Ryerson & Son, Inc., Jos. T.

BOLTS AND NUTS.
Ryerson & Son, Inc., Jos. T.

BONDS AND STOCKS (TEXTILE MILL).
American Trust Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Allen Co.
Morris & Co., Inc.
Smith Mfg. Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BRICK (BUILDING & PAVING).
National Paving Brick Mfg. Asso.

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BRUSHES—MILL.
Atlanta Brush Co.
Mason Brush Wks.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Morris & Co., Inc.
Smith Mfg. Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company.

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (PORTABLE STEEL).
Dowman, George.

BUILDINGS (READY BUILT).
Minter Homes Co.

BUILDINGS (ALL STEEL).
Dowman, George.
Truscon Steel Co.

BUILDING MATERIAL.
Birmingham Slag Co.
Callahan Co., T. J.
Detroit Graphite Co.
Dixie Portland Cement Co.
Dowman, George.
Dufur & Co.
Kirkpatrick Lumber & Timber Co.
Minter Homes Co.
Murphy's Sons, C. P.
National Paving Brick Mfg. Asso.
Richardson Co.
St. Louis Surfacer & Paint Co.
Sanymetal Products Co.
Sonneborn Sons, Inc., L.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
Truscon Steel Co.
Variety Fire Door Co.
Ware Paint Co.

BURR PICKERS.
Proctor & Schwartz, Inc.
Sargent's Sons, C. G.

BUSHINGS.
Moccasin Bushing Co.
Southern Spindle & Flyer Co.

BUSINESS METHODS.
(See Consultants.)

CABINETS.
(See Lockers.)

CALENDERS.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTER-TELEPHONE.
Carter Electric Co.

CAMPING EQUIPMENT, FURNITURE, STOVES, LIGHTS, ETC.
Smith Mfg. Co.

CANS (DRYING).
(See Drying Equipment.)

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARDS (BUSINESS OR CALLING—ENGRAVED).
Wiggins Co., John B.

CARBON BURNING APPARATUS.
Oxweld Acetylene Co.

CARBON RODS AND PASTE (WELDING).
Oxweld Acetylene Co.

CARBONIZING MACHINERY.
Klauder-Weldon Dyeing Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

CARDING MACHINERY AND SUPPLIES.
Howard & Bullough.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD & NAPPER CLOTHING.
Howard Bros. Mfg. Co.

CARD FEEDS.
Proctor & Schwartz, Inc.
Schofield Co., Wm.
Whitin Machine Co.

CARD GRINDING MACHINERY.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Textile Finishing Mchry. Co.

CARRIER APRONS.
(See Aprons.)

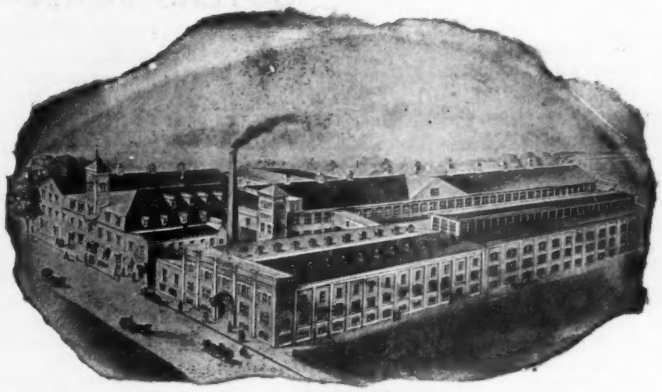
CARRIER SYSTEM.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Machry. Co.
Louden Machinery Co.
Mathews Conveyor Co.

CASES—WOODEN.
(See Packing Cases.)

CASTINGS.
Briggs, Schaffner Co.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Rome Machine & Fdry. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

When You Want
SERVICE—
QUALITY—
SATISFACTION—



come to Emmons for your COTTON HARNESS, MAIL HARNESS, SELVEDGE HARNESS, REEDS, SLASHER AND STRIKING COMBS, WARPER AND LIECE REEDS, BEAMER AND DRESSER HECKS, MENDING EYES, JACQUARD HEDDLES, ETC.
With a big modern plant working continually, striving at all times to produce products worthy of the name EMMONS, we are in a position to give you the quality and service you naturally expect.

Let us have your inquiry.
EMMONS LOOM HARNESS CO., LAWRENCE, MASS.
Largest Manufacturers of Loom Harness and Reeds in America
SOLE AGENTS FOR WARDWELL PICKERS SOUTHERN REPRESENTATIVE: GEO. F. BAHAN.

EMMONS LOOM HARNESS And REEDS

Shafts, Pulleys, Hangers, Belting Packing, Lacing
BOILERS
For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies, and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store
AUGUSTA, GEORGIA

COTTON MILL REPAIRS
SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.
WE WILL SAVE YOU TIME
AND WON'T EXPECT YOUR ORDER IF WE CAN'T
SAVE YOU SOME MONEY TOO
Briggs-Shaffner Company
WINSTON-SALEM, N. C.
MACHINE WORK FOUNDRY WORK

SYDNOR PUMP & WELL CO., INC.
RICHMOND, VIRGINIA
DEEP WELL DRILLING—WATER SUPPLY ENGINEERS
Twenty-Five Years Experience in Solving Water Problems
LUITWIELER NON-PULSATING DEEP WELL PUMPS
The Most Efficient Water Supply Equipment Made.
SYDNOR'S SUPREME SERVICE

TEXTILE MILLS INDUSTRIAL PLANTS
PARK A. DALLIS
ARCHITECT AND ENGINEER
1604 CANDLER BLDG. ATLANTA, GEORGIA

BUYERS' INDEX—Continued.

CEMENT.
Dixie Portland Cement Co.

CEMENT REINFORCEMENT.
Birmingham Slag Co.
Truscon Steel Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Detroit Graphite Co.
Dixon Crucible Co., Jos.
Hockaday Co.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

CENTRAL STATION (ELECTRIC).
Tennessee Electric Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.
Diamond Chain & Mfg. Co.
Fulton Supply Co.
Link Belt Co.
Morse Chain Co.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas.
Fulton Supply Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING MACHINERY (CLOTH AND YARN).
Rome Mch. & Fdry. Co.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
(See Cloth.)

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Root Co.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.
Root Co.

CLOSETS—WATER.
(See Toilets.)

CLOTH (ROLLER, CLEARER AND SLASHER).
Best & Co., Edw. H.
Phila. Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH ROOM MACHINERY.
Butterworth & Sons Co., H. W.
Firsching, J. A.
Foster Machine Co.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Fulton Supply Co.
Link-Belt Company.

CLUTCH LININGS.
Carlyle-Johnson Mch. Co.

COAL AND COKE.
General Coal Co.

COAL AND ASH HANDLING MACHINERY.
Link-Belt Company.
Louden Machinery Co.

COAL TAR DISINFECTANTS.
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBER AND COMBER SUPPLIES.
Foster Machine Co.
U S Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
Curtis Pneumatic Mchry. Co.
Fulton Supply Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONCRETE REINFORCING STEEL.
Ryerson & Son, Inc., Jos. T.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.)

CONE BELT TENSION DEVICE.
Bahan Textile Mch. Co.

CONES (KNITTING YARN).
Foster Mch. Co.
Sonoco Products Co.

CONE WINDING MACHINE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTANTS (BUSINESS METHODS).
Ernst & Ernst.

CONSULTING ENGINEERS.
(See Architects and Engineers)

CONTRACTORS AND ENGINEERS—BUILDING.
Dowman, George.
Sirrine & Co., J. E.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (PAINTING).
Williams, C. L.

CONTRACTORS (ROOFING).
Dowman, Geo.
Murphy's Sons, C. P.

CONTRACTORS (PAVING).
McCrary Co., J. B.

CONTRACTORS (WATERWORKS).
McCrary Co., J. B.

CONTRACTORS (SEWAGE).
McCrary Co., J. B.

CONTROLLING INSTRUMENTS—TEMPERATURE.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Dowman, George.
Elwell-Parker Elec. Co.
Fulton Supply Co.
Link-Belt Co.
Louden Machinery Co.
Mathews Gravity Carrier Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield, Wm. Co.
Wagner Mfg. Co.

CONVEYORS—PORTABLE.
Link-Belt Co.
Mathews Gravity Carrier Co.

CONVEYORS (ROLLER).
Mathews Gravity Carrier Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING EQUIPMENT.
American Blower Co.
Buffalo Forge Co.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

CORPORATION FINANCE (TEXTILE).
American Trust Co.

CORRUGATED SHEET STEEL.
Ryerson & Co., Inc., Jos. T.

COST SYSTEMS.
Ernst & Ernst.

COTTAGES (READY BUILT).
Minter Homes Co.

COTTON CLEANING AND AERATING MACHINE.
Murray Company, The.

COTTON FANS.
(See Blowers.)

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
Aberfoyle Mfg. Co.
Boger & Crawford.
Callaway Mills.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Jamieson, J. B.
Lane & Co., J. H.
Meritzer, H. S.
Moss-McDuffe & Co.
Quissett Mill.
Tolar & Hart.
Weimar Bros.
Wellington, Sears & Co.
Whitman Co., Inc., Wm.
Woodward, Baldwin & Co.

COTTON MERCHANTS AND BROKERS.
Beer & Co., H. & B.

COTTON MILL MACHINERY AND SUPPLIES.
American Blower Co.
Atlanta Harness & Reed Mfg. Co.
Auto Creel Corp.
Bahan Textile Mch. Co.
Barber-Colman Co.
Brown Co., David.
Butterworth & Sons, H. W.
Chapman Electric Neutralizer Co.
Crompton & Knowles Loom Works.
Draper Corporation.
Dowman, George.
Eclipse Textile Devices, Inc.
Firsching Co., J. A.
Fletcher Works.
Foster Machine Co.
Foxboro Co., Inc.
Fulton Supply Co.
Harris Co., Geo. W.
Hopedale Mfg. Co.
Howard Bros. Mfg. Co.
Hunt Machine Co., Rodney.
Hyatt Roller Bearing Co.
Jacobs Mfg. Co., E. H.
Lestershire Spool Mfg. Co.
Lowell Crayon Co.
Mill Devices Co.
Mossberg Pressed Steel Corp.
Parkar Co., Walter L.
Phila. Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reutlinger, J. J.
Root Co.
Roy & Son, B. S.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Stafford Co.
Steel Heddle Mfg. Co.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Textile Rubber Co.
Toledo Scale Co.
Tolhurst Mch. Wks.
Walker Mfg. Co.
U S Bobbin & Shuttle Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON TAPE LOOM.
Fletcher Works.
Foster Mch. Co.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Foxboro Co.
Root Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Dodge Mfg. Co.

COVERING—ROLLER.
Bond Co., Chas.

CRANES.
(See Hoists.)

CRAYONS.
Eclipse Crayon Co.
Lowell Crayon Co.

CREELS.
Auto Creel Corp.
Suter, Alfred.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
Southern Wood Preserving Co.

CULVERTS AND SEWER PIPE.
Carolina Metal Culvert Co.

CUTS FOR PRINTING.
Jacobs & Co.

CUTTERS—CLOTH.
(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

DECARBONIZING APPARATUS
Oxweld Acetylene Co.

CUTTING APPARATUS (OXY-ACETYLENE & OXY HYDROGEN).
Bird-Potts Co., Inc.
Oxweld Acetylene Co.

DAMPER REGULATORS.
Locke Regulator Co.

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Allen Co.

DEXTRINES.
(See Dyestuffs and Chemicals.)

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs & Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFER FILLETS.
(See Fillets.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Dowman, George.
Mills Co.
Variety Fire Door Co.

DRAINAGE ENGINEERS.
Carolina Metal Culvert Co.

DRAWINGS AND ARTWORK.
Jacobs & Co.

DRAWING FRAMES.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

DRESSING ROOMS (METAL PARTITIONS).
Mills Co.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRY CLEANING MACHINERY.
Rome Machine & Fdry. Co.

DRYING APPARATUS.
American Blower Co.
Buffalo Forge Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.

DRYING FORMS—HOSIERY.
Phila. Metal Drying Form Co.

DRYING MACHINERY AND EQUIPMENT.
American Blower Co.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Philadelphia Drying Mchry. Co.
Phila. Metal Drying Form Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Proctor & Schwartz, Inc.
Schofield & Sons, Wm.

DYERS, BLEACHERS AND FINISHERS.
Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.
U. S. Finishing Co.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Fulton Co.
Hightower Box & Tank Co.
Hungerford & Terry, Inc.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rome Machine & Fdry. Co.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Franklin Process Co.

DYE BAGS OR NETS.
Smith Mfg. Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers.)

DYESTUFFS AND CHEMICALS).
American Diamalt Co.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Boson & Lane.
DuPont de Nemours & Co., E. I.
Ciba Co., Inc.
Electro Bleaching Gas Co.
Fleischmann Co., The.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Klipstein & Co., A.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Wks.
Quaker City Chemical Co.
Roessler & Hasslacher Chemical Co.
New Brunswick Chemical Co.
Penick & Ford, Ltd.
Rohm & Hass Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

ELECTRIC CONDUIT AND FITTINGS.
(See Electrical Machinery and Supplies.)

ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Perry-Mann Electric Co.
Southern Elec. Supply Co.

ELECTRICAL ENGINEERS AND CONTRACTORS.
Huntington & Guerry, Inc.
McCrary Co., J. B.
Panton, Harrison D.
Perry-Mann Electric Co.

ELECTRIC NEUTRALIZERS.
Chapman Electric Neutralizer Co.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

ELECTRICAL MACHINERY, INSTRUMENTS AND SUPPLIES.
Allis-Chalmers Mfg. Co.
American Blower Co.
Buffalo Forge Co.
Carter Electric Co.
Chapman Electric Neutralizer Co.
Cooper Hewitt Electric Co.
Curtis Co., The.
Elwell-Parker Electric Co.
Fulton Supply Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Elec. Supply Co.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC POWER.
(See Power.)

Welcome to New York and the Alamac

71 ST STREET AND BROADWAY

A masterpiece of modern hotel creation. Most convenient, yet quiet. A revelation in hospitality and service, offering many innovations including Servidors, taxis, etc.

Unique Congo Room—Medieval Grille and Blue Room Restaurants.

New York's latest hotel achievement

LATZ OWNERSHIP —MANAGEMENT

Hotel Tuller

Convention Headquarters

STANDARD OF SERVICE

Headquarters in Detroit for
DETROIT AUTOMOBILE CLUB
OLD COLONY CLUB

Table D'Hote Dinner $1.50

Business Men's Lunch 85c

800 ROOMS—800 BATHS
DAILY RATES: SINGLE $3.00 UP
New Arabian Dining Room finest in United States

HOTEL TULLER CO.
DETROIT
C. C. SCHANTZ, Gen. Mgr.
GRILLE CAFETERIA

$2.50 Per Day

and upward

is one reason for the rapidly growing popularity of the Hotel Martinique.

Another is the consistent economy of the entire establishment. Here you may enjoy a Club Breakfast at 45c., consisting of Fruit or Cereal, Bacon and Egg, and Rolls and Coffee —Special Luncheon and Dinners of superior quality are also served at the most moderate possible prices.

No location can be possibly more convenient than that of the Martinique. One block from the Pennsylvania Station (via enclosed subway)—Nine blocks from Grand Central—one block from the greatest and best Shops of the City—half a dozen blocks from the Opera and the leading Theatres —and directly connected with the Subway to any part of the City you wish to reach.

"The BEST without extravagance"

Hotel Martinique

Affiliated with Hotel McAlpin

Broadway-32nd to 33rd Sts.
NEW YORK

A. E. Singleton, *Manager.*

BUYERS' INDEX—Continued.

ELECTRIC TRACTORS AND TRUCKS.
(See Tractors and Trucks—Electric.)

ELECTROTYPES.
Jacobs & Co.

ELEVATORS—PORTABLE.
Mathews Gravity Carrier Co.

ELEVATORS.
Link-Belt Company.
Mathews Gravity Carrier Co.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
(See Paint.)

ENGINEERS—MILL.
(See Architects.)

ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.
Fulton Supply Co.

ENGINES (STEAM).
Allis-Chalmers Mfg. Co.
American Blower Co.
Fulton Supply Co.
Lombard Iron Works & Supply Co.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
American Blower Co.
Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.
Westinghouse Elec. & Mfg. Co.

ENGINE STOP AND SPEED LIMIT SYSTEMS.
Locke Regulator Co.

ENGINEERS (CONSULTANT AND EFFICIENCY).
Ernst & Ernst.

ENGINEERS, CONTRACTORS & BUILDERS (SANITARY & PAVING).
McCrary Co., J. B.

ENGINEERS (TEXTILE AND MECHANICAL CONSULTING).
Panton, Harrison D.

ENGINEERS (MECHANICAL).
Bird-Potts & Co., Inc.

ENGRAVINGS AND CUTS.
Jacobs & Co.

ETCHING—PRINTING.
Jacobs & Co.

EXHAUSTERS.
(See Blowers.)

EXPORTERS—COTTON.
(See Brokers.)

EXTRACTORS—HYDRO.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY AND INDUSTRIAL SITES.
(See Industrial Sites.)

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
American Blower Co.
Buffalo Forge Co.
Carter Electric Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

FANS—CONVEYING, POWER AND EXHAUST.
(See Blowers and Blowing Systems.)

FASTENERS—BELT.
(See Belt Fasteners.)

FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
(See Automatic Feeders.)

FELTING MACHINERY.
Proctor & Schwartz, Inc.

FENCE—STEEL AND IRON.
Cyclone Fence Co.
Dowman, George.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FILLETS (CYLINDER DOFFER, BURNISHER AND STRIPPER).
Howard Bros. Mfg. Co

FILLING—CAP AND WARP.
U S Bobbin & Shuttle Co.

FILM (MOTION PICTURE).
(See Theatre Equipment.)

FILTERS—OIL.
Bowser & Co., Inc., S. F.

FILTERS—WATER.
Hungerford & Terry, Inc.

FILTERS (ALUM).
Lennig & Co., Chas.

FILTER CLOTHS.
Smith Mfg. Co.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING, BLEACHING AND SIZING MATERIALS.
American Diamalt Co.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Corn Products Refining Co.
DuPont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Fleischman Co., The.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works.
New Brunswick Chemical Co.
Penick & Ford, Ltd.
Quaker City Chemical Co.
Roessler & Hasslacher Co.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

FIRE DOORS AND HARDWARE.
Dowman, George.
Sanymetal Products Co.
Truscon Steel Co.
Variety Fire Door Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

FLAT STEEL HEDDLES.
Steel Heddle Mfg. Co.

FLAX SPINNING.
U S Bobbin & Shuttle Co.

FLEXIBLE COUPLNGS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

FLOOD LIGHTS—ELECTRIC.
Cooper Hewitt Electric Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

FLOORS (TAR CONCRETE).
Murphy's Sons, C. P.

FLOORING LUMBER.
Kirkpatrick Lumber & Timber Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FLUX (WELDING).
Bird-Potts Co., Inc.
Oxweld Acetylene Co.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FOUNDERS.
Briggs-Schaffner Co.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

FOUNTAINS—DRINKING.
Murdock Mfg. & Supply Co.
Bundle-Spence Mfg. Co.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FURNITURE (FOLDING—CAMP).
Smith Mfg. Co.

FURNITURE—MILL.
Durabilt Steel Locker Co.
Mills Co.
Sanymetal Products Co.
Smith Mfg. Co.

FUSES—ELECTRIC.
Carter Electric Co.
Fulton Supply Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.

GARAGES (PORTABLES—METAL).
Dowman, George.

GARNETT MACHINES.
Proctor & Schwartz, Inc.

GAS ENGINES.
(See Engines—Gas.)

GASOLINE .LIGHTING .SYSTEMS, LANTERNS, ETC.
Smith Mfg. Co.

GASOLINE CAMP STOVES.
Smith Mfg. Co.

GAUGES—STEAM PRESSURE, ETC.
Fulton Supply Co.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Fulton Supply Co.
Lunkenheimer Co.

GAUGES (LIQUID LEVEL).
Foxboro Co., Inc., The.
Lunkenheimer Co.
Taylor Inst. Co.

GAUGES—WATER.
Fulton Supply Co.
Lunkenheimer Co.

GEARS—SILENT.
Dodge Mfg. Co.
Fulton Supply Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

GEAR CUTTING AND CUTTERS.
Cresson-Morris Co.

GEAR PULLERS.
General Electric Co.

GENERATORS—ELECTRIC.
(See Motors and Generators.)

GLOVES (ASBESTOS).
Oxweld Acetylene Co.

GOGGLES (WELDING).
Oxweld Acetylene Co.

GLASSWARE AND DISHES
(See Dishes.)

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Detroit Graphite Co.
Dixon Crucible Co., Jos.

GRATES—BOILER.
International Eng. Works.
Lombard Fdy. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
(See Lubricants.)

GRAVEL AND SLAG ROOFING.
Murphy's Sons, C. P.

GREASE CUPS.
(See Lubricators.)

GRINDER—CARD, CYLINDER ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery.)

GAUGES (WELDING).
Oxweld Acetylene Co.

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS—MACHINE, SKYLIGHT, WINDOW, ETC.
Dowman, George.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., I. E.

GUMS.
(See Finishing and Sizing Materials.)

HACK AND BAND SAWS AND BLADES.
Racine Tool & Mch. Co.

HALFTONES—PRINTING.
Jacobs & Co.

HANGERS.
(See Shafting and Hangers.)

HANK CLOCKS.
(See Counters.)

HARDWARE—BUILDING.
Dowman, George.
Sanymetal Products Co.

HARNESS—LOOM.
(See Loom Harness.)

HARNESS TWINE.
Harris Co., Geo. W.

HEADS—BOBBIN AND SPOOL.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U S Bobbin & Shuttle Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

HEDDLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Howard Bros. Mfg. Co.
Reutlinger, J. J.
Steel Heddle Mfg. Co.
Walker Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Elwell-Parker Electric Co.
Fulton Supply Co.
Link-Belt Company.
Louden Mchry. Co.
Morse Chain Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HORNS AND MUSICAL INSTRUMENTS.
Conn, Ltd., C. G.

HOSE (WELDING).
Oxweld Acetylene Co.

HOSIERY DYEING MACHINERY.
Cole Mfg. Co., R. D.
Franklin Process Co.
Philadelphia Drying Mchry. Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY YARNS.
(See Yarn Manufacturers.)

HOTELS.
Hotel Almac.
Hotel Martinique.
Hotel Tuller.

HOUSES AND MILL COTTAGES (READY BUILT).
Minter Homes Co.

HUMIDIFYING APPARATUS.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.

HUMIDIFYING INDICATING INSTRUMENTS.
Foxboro Co., Inc., The.
Taylor Instrument Co.

HUMIDITY RECORDERS.
Foxboro Co., Inc., The.

HYDGRODEIKS.
Tayor Instrument Co.

HYGROMETERS.
Foxboro Co.
Taylor Instrument Co.

HYDRANTS (FIRE).
Murdock Mfg. & Supply Co.

HYDRAULIC TURBINES.
(See Turbines—Hydraulic.)

HYDRO EXTRACTORS.
(See Extractors.)

ILLUMINATING ENGINEERS.
Cooper Hewitt Electric Co.
Huntington & Guerry, Inc.
Panton, Harrison D.

INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.
Root Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

INDUSTRIAL SITES.
A. & W. P. Ry.
Central of Ga. Ry.
Georgia Ry.
Nashville Industrial Corp.
Seaboard Airline Ry.
Southern Ry.
Tennessee Electric Power Co.

INK—STENCIL AND MARKING.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

IRON AND STEEL.
Ryerson & Son, Inc., Jos. T.

IRON WORK—ORNAMENTAL.
Cyclone Fence Co.
Dowman, George.
Dufur & Co.
Lombard Iron Works & Supply Co.

JACK SPOOLS.
(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JACQUARD HEDDLES.
Steel Heddle Mfg. Co.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Proctor & Schwartz, Inc.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

KNIT GOODS.
(See Cotton Cloth Commission Merchants and Dealers.)

KNIT GOODS WASHERS.
(See Washers—Cloth.)

KNITTING MACHINERY AND SUPPLIES.
Brinton Co., H.
Franklin Needle Co.
General Machine Works.
Granite State Needle Co.
Hemphill Mfg. Co.
Scott & Williams.
Shardlow, J. W.
Torrington Co.
Standard Trump Bros. Mch. Co.
Wildman Mfg. Co.
Williams, Chauncey A.

KNITTING NEEDLES.
Franklin Needle, Co.
Granite State Needle Co.
Williams, Chauncey A.

KNOTTERS.
Barber-Colman Co.
Mill Devices Co.

LABORATORY INSTRUMENTS.
Foxboro Co., Inc.
Root Co.
Taylor Instrument Co.

LACING—BELT.
(See Belt Lacing.)

LAMPS—INCANDESCENT AND ARC.
Carter Electric Co.
Cooper Hewitt Electric Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

LAMP GUARDS—KEY LOCKING.
(See Electric Lamp Guards.)

LAMP REFLECTORS.
Carter Electric Co.
Cooper Hewitt Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

LANDSCAPE ARCHITECTS.
(See Village Architects.)

LAPPERS.
Saco-Lowell Shops.
Whitin Machine Works.

LATHES.
Fulton Supply Co.

LAUNDRY BAGS, BASKETS & NETS.
Smith Mfg. Co.

LAUNDRY MACHINERY.
American Laundry Mchry. Co.
Fletcher Works.
Hunt Machine Co., Rodney.
Rome Machine & Fdry. Co.
Schaum & Uhlinger.
Tolhurst Machine Works.

LEAD BURNING APPARATUS (OXY-ACETYLENE AND OXY CITY GAS).
Oxweld Acetylene Co.

LEATHER BELTING.
(See Belting.)

ESTABLISHED 1849

GEO. W. HARRIS CO.

OLDEST MANUFACTURERS IN AMERICA OF

Loom Harnesses, Harness Twine and Mending Eyes

Our customers of 70 years ago are still our customers, and numbered among them are the largest mills in the world. The use of the highest grade materials, backed by 75 years of experience, assures products that will render the highest degree of efficiency and service. They are all guaranteed in every way.
We will be pleased to have a representative call on you and figure on your requirements for both prompt and future shipments.

199 PERKINS STREET **LOWELL, MASS.**

Southern Office: 201 Augusta St., GREENVILLE, S. C.

DAVIS SEPTIC TANKS

Our indoor waste water sewage disposal system is the last word in sanitation and economy.

Write for particulars.

Davis Septic Tank and Engineering Company

217½ South Tryon St. Charlotte, North Carolina

AMERICAN TRUST CO.

BOND DEPARTMENT

Specializes in Textile Corporation Finance, Negotiates purchase and sale of cotton Mills. Offers conservative investments in Textile preferred stocks to yield from 6½% to 7½%.

BOND DEPARTMENT

American Trust Co.

FRANK B. GREEN, Manager.
CHARLOTTE, N. C.

PUMPS

A type for every service.
Bulletins on request.

The Goulds Manufacturing Company
SENECA FALLS, N. Y.

GOULDS

TIMBERS - FACTORY FLOORING
CEILING - SIDING
SHIPLAP - ROOFERS

2x4 - 2x6 - 2x8 - 2x10 - 2x12
OAK and MAPLE FLOORING

KIRKPATRICK
LUMBER & TIMBER CORP.
BIRMINGHAM, ALA.

High Grades *Prompt Shipments*

UCPC

Direct
Sulphur
Chrome
} **Dyes** {
Acid
Vat
Basic

Special Shades Matched
VELVETEEN

The Best Boil-off and Finish

Softeners *Oils* *Finishes*

UNITED CHEMICAL PRODUCTS CORPORATION

Importers, Exporters and Manufacturers

York and Colgate Sts. Jersey City, N. J.
Southern Office 307 Commercial National Bank Building Charlotte, N. C.
Pawtucket, R. I.
Norwalk, Conn.
Chicago, Ill.

BUYERS' INDEX—Continued.

LEATHER SPECIALTIES.
American Supply Co.
Bond Co., Chas.
Graton & Knight Mfg. Co.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

LIGHTS—FLOOD.
(See Flood Lights.)

LIGHTING ENGINEERS AND CONTRACTORS.
(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns—Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

LOADERS—WAGON AND TRUCK.
Link-Belt Company.

LOCKERS AND CABINETS.
Allen Co.
Dowman, George.
Durabilt Steel Locker Co.
Mills Co.
Sanymetal Products Co.

LOGWOOD EXTRACT.
(See Dyestuffs and Chemicals.)

LOOMS.
Crompton & Knowles Loom Works.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

LOOM ATTACHMENTS—AUTOMATIC.
Draper Corporation.
Hopedale Mfg. Co.

LOOM HARNESS.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.
Harris Co., Geo. W.
Steel Heddle Mfg. Co.
Walker Mfg. Co.

LOOPS (END).
Reutlinger Co., J. J.

LOOP PICKERS.
Jacobs Mfg. Co., E. H.

LUBRICANTS.
Dixon Crucible Co., Jos.
N. Y. & N. J. Lubricant Co.

LUBRICATORS.
Bowser & Co., S. F.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

LUG STRAPS.
(See Straps—Lug.)

LUG STICKS.
Allen Co.

LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

LUNCH ROOM EQUIPMENT.
(See Restaurant.)

MACHINE GUARDS.
(See Guards—Machine.)

MACHINE TOOLS.
(See Tools.)

MACHINISTS
Bird-Potts Co., Inc.
Briggs-Schaffner Co.
Cresson-Morris Co.
Lombard Fdry. & Mch. Wks.

MAILS (INSERTED STEEL).
Reutlinger, J. J.

MANIFOLDS.
Oxweld Acetylene Co.

MARKING POTS, STENCILS, INKS, ETC.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

MENDING EYES.
Harris Co., Geo. W.

MERCERIZED YARNS.
(See Yarn Manufacturers.)

MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.

MERCERIZED YARNS.
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.
Hunter Mfg. & Comm. Co.

MERCERIZING MACHINERY.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

METAL CEILINGS, ETC.
Dowman, George.
Truscon Steel Co.

METAL CUTTING MACHINES.
Racine Tool & Mch. Co.

METAL SIDING.
Dowman, George.

METALS—PERFORATED.
(See Screens and Sieves.)

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

METERS—COUNTING.
(See Counters.)

MILL BASKETS AND BOXES.
(See Boxes—Mill.)

MILL ENGINEER.
(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

MILL SUPPLIES—MISCELLANEOUS.
(See Supplies—Mill.)

MILL WHITE PAINT.
(See Paint.)

MOPS.
Atlanta Brush Co.

MOTION PICTURES.
(See Theatre Equipment.)

MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
Fulton Supply Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

MOVING PICTURE MCH. AND SUPPLIES.
(See Theatre Equipment.)

MUSICAL INSTRUMENTS.
Conn, Ltd., C. G.

NAPPER ROLL GRINDING MACHINES.
(See Card Grinders.)

NAPPING MACHINERY.
Saco-Lowell Shops.

NAPPER CLOTHING.
Howard Bros. Mfg. Co.

NEEDLES—KNITTING.
Franklin Needle Co.
Granite State Needle Co.
Torrington Co.
Williams, Chauncey A.

OFFICE EQUIPMENT & SUPPLIES.
Atlanta Stamp & Stencil Wks.
Jacobs & Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
(See Partitions.)

OIL—LUBRICATING.
Johnson & Co., Inc., Oliver.
N. Y. & N. J. Lubricant Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
(See Engines Oil.)

OILS—FINISHING.
(See Finishing and Sizing Materials.)

OIL CUPS.
(See Lubricants.)

OIL PAPER.
Bradley Mfg. Co., A. J.

OIL PUMPS.
(See Pumps—Oil.)

OIL SEPARATORS.
(See Separators.)

OIL TANKS.
Bowser & Co., Inc., S. F.

OILING DEVICES.
(See Lubricators.)

OPENING MACHINERY—COTTON, WOOL, WASTE, ETC.
Murray Company, The.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

OVERHEAD CARRIERS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Dowman, George.
Louden Mchry. Co.

OXIDIZING MACHINERY.
Phila. Drying Machinery Co.

OXY-ACETYLENE APPARATUS AND SUPPLIES.
Bird-Potts Co., Inc.
Fulton Supply Co.
Oxweld Acetylene Co.

OXYGEN.
Oxweld Acetylene Co.

PACKING BOXES AND CASES—WOODEN.
Hightower Box & Tank Co.

PACKINGS.
Jenkins Bros.

PAINT.
American Cement Paint Co.
Detroit Graphite Co.
Dixon Crucible Co., Jos.
Hockaday Co.
Johnson & Co., Oliver.
St. Louis Surfacer & Paint Co.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.
Williams, C. L.

PAINT SPRAYING EQUIPMENT.
Wadsworth, Howland & Co., Inc.

PAINTING CONTRACTORS.
(See Contractors.)

PANEL BOARD.
(See Switchboards.)

PAPER.
Bradley Mfg. Co., A. J.

PARTITIONS—STEEL AND WIRE.
Cyclone Fence Co.
Dowman, George.
Mills Co.
Sanymetal Products Co.

PAVING BRICKS.
National Paving Brick Mfg. Asso.

PERBORATE OF SODA.
Roessler & Hasslacher Chemical Co.

PERFORATED METAL.
(See Screens and Sieves.)

PEROXIDES.
Roessler & Haslacher Chemical Co.

PICK COUNTERS.
(See Counters.)

PICKERS—CURLED HAIR.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

PICKERS—LEATHER.
Bond Co., Chas.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

PICKER LOOPS.
Jacobs Mfg. Co., E. H.

PICKER BAGS.
Smith Mfg. Co.

PICKER CONE BELT TENSION DEVICE.
Bahan Textile Mch. Co.

PICKER STICKS.
Garland Mfg. Co.

PICKING MACHINERY.
Howard & Bullough Am. Machine Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

PIN BOARDS.
Washburn, Inc.

PINIONS.
General Electric Co.

PIPE—STEEL RIVETED.
Fulton Supply Co.
Youngstown Sheet & Tube Co.

PIPE AND PIPE FITTINGS.
Fulton Supply Co.
Lunkenheimer Co.
Parks-Cramer Co.

PIPE JOINT COMPOUND.
Dixon Crucible Co., Jos.
Fulton Supply Co.

PIPING—COTTON.
Youngstown Sheet & Tube Co.

PIPE BENDING.
Youngstown Sheet & Tube Co.

PLAYGROUND APPARATUS & EQUIPMENT.
Hill-Standard Co.
Murdock Mfg. & Sup. Co.
Rundle-Spence Mfg. Co.

PNEUMATIC MACHINERY & TOOLS.
Curtis Pneumatic Mchry. Co.

PORCELAIN GUIDES.
Mitchell-Bissell Co.

PORTABLE HOUSES AND GARAGES (STEEL).
Dowman, George.

PORTABLE CONVEYORS.
(See Conveyors.)

POSTS—FENCE (WOOD).
Southern Wood Preserving Co.

POWER—ELECTRIC.
Tennessee Electric Power Co.

POWER TRANSMISSION EQUIPMENT.
Aldrich Machine Works.
Allis-Chalmers Mfg. Co.
Bond Co., Chas.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Detroit Belt Lacer Co.
Diamond Chain & Mfg. Co.
Dixon Crucible Co., Jos.
Dodge Mfg. Co.
Fafnir Bearing Co.
Flexible Steel Lacing Co.
Fulton Supply Co.
General Electric Co.
Graton & Knight Mfg. Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Mocassin Bushing Co.
Morse Chain Co.
Reeves Pulley Co.
Renold, Inc., Hans.
Rhoads & Sons, J. E.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

PREHEATING APPARATUS.
Oxweld Acetylene Co.

PRESERVATIVE PAINT FOR METAL WORK.
(See Paints.)

PRESSES.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Logemann Bros. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Textile Finishing Machinery Co., The.

PRESSURE GAUGES.
(See Gauges.)

PRESSURE REGULATORS.
(See Regulators—Pressure.)

PRINTERS (CLOTH).
(See Dyers.)

PRINTING.
Jacobs & Co.
Showalter Printing Co., A. J.

PRINTING EXTRACTORS—HYDRO.
Tolhurst Machine Works.

PROPELLER FANS.
(See Blowers.)

PSYCHROMETERS.
Foxboro Co., Inc., The.

PULLEYS.
Cresson-Morris Co.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Reeves Pulley Co.

PULLEY COVERING.
Reeves Pulley Co.
Williams & Sons, I. B.

PUMPS.
Allis-Chalmers Mfg. Co.
American Oil Pump & Tank Co.
Fulton Supply Co.
Goulds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
Vogt Brothers Mfg. Co.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

PUMPS—OIL.
American Oil Pump & Tank Co.
Bowser & Co., S. F.
Lunkenheimer Co.
Vogt Brothers Mfg. Co.

PUMP GOVERNORS.
Locke Regulator Co.

PUMP VALVES.
(See Valve Discs.)

PYROMETERS.
Foxboro Co.
Taylor Instrument Co.

QUILLS.
Jordan Mfg. Co.
U S Bobbin & Shuttle Co.

QUILL CLEANING MACHINES.
Terrell Machine Co.

RAILS (STEEL).
Ryerson & Son, Inc., Jos. T.

RAILROADS.
A. & W. P. Ry.
Central of Ga. Ry.
Georgia Ry.
Seaboard Airline Ry.
Southern Ry.

RECEPTACLES—FIBRE.
(See Fibre Products.)

RECOVERING TOP FLATS.
Howard Bros. Mfg. Co.

RECORDING INSTRUMENTS.
Bristol Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

REEDS AND REED WIRE.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Steel Heddle Mfg. Co.
Walker Mfg. Co.

REELS.
Allen Co.
Crompton & Knowles Loom Works.
Draper Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

REFLECTORS—LAMPS.
(See Lamp Reflectors.)

REGULATORS—LIQUID LEVEL.
Foxboro Co., Inc.
Fulton Co.
General Electric Co.

REGULATORS (COMPRESSED GAS).
Oxweld Acetylene Co.

REGULATORS (DAMPER).
Locke Regulator Co.

REGULATORS—PRESSURE.
Foxboro Co., Inc., The.
Fulton Co.
General Electric Co.
Locke Regulator Co.
Taylor Instrument Co.

REGULATORS—TEMPERATURE.
(See Temperature Controllers.)

REINFORCING SLAG.
Birmingham Slag Co.

REPAIRING—ELECTRICAL.
Briggs Shaffner Co.
Huntington & Guerry, Inc.
Southern Electrical Supply Co.
Westinghouse Elec. & Mfg. Co.

REPAIRING—TEXTILE MACHINERY, ETC.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
General Machine Works.
Southern Spindle & Flyer Co.

RESTAURANT EQUIPMENT.
Sanymetal Products Co.

RIBBERS.
(See Knitting Machinery.)

RIB TOP CUTTERS.
General Machine Works.
Wildman Mfg. Co.

RING TRAVELERS—STEEL AND BRONZE.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

RINGS—SPINNING.
(See Spinning Rings.)

ROCKER SHAFT BEARINGS.
(See Bearings.)

RODS (WELDING).
Oxweld Acetylene Co.

ROLLER BEARINGS.
Hyatt Roller Bearing Co.

ROLLER CLOTH.
(See Cloth.)

ROLLER CONVEYORS.
Mathews Gravity Carrier Co.

ROLLER LEATHER.
Bond & Co., Chas.

WATER FILTRATION AND SOFTENING EQUIPMENT

The importance of your choice of filtration equipment can not be too strongly emphasized. A thorough study of your water supply problem should be made by experts.

Thirty-eight years' study of the exacting requirements of the textile industry enable Hungerford & Terry to offer you a complete and competent service —from taking the first sample of water from the proposed supply to erecting the plant complete, and ready for operation.

HUNGERFORD & TERRY, INC.

CLAYTON, N. J.

Send for descriptive literature. Plans and estimates promptly supplied without obligation on your part.

FULTON SUPPLY CO.

70 NELSON ST., ATLANTA, GA.

Get Our Prices on

BOBBINS — SPOOLS — TRAVELERS — CHECK STRAPS AND TEXTILE SUPPLIES

LEATHER BELTING
TRANSMISSION EQUIPMENT
PIPE
VALVES AND FITTINGS
PUMPS
MOTORS
LATHES
MACHINE TOOLS
WELDING OUTFITS AND SUPPLIES
ELECTRIC DRILLS
ETC.

COMPLETE STOCKS MILL SUPPLIES AND MACHINERY

Quality—Service—Right Prices

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY

Iron Founders, Textile Machinery Builders.

Krams Ave., Manayunk, Philadelphia, Pa.

HARRISON D. PANTON, E. E.

Consulting Engineer

Electrical Textile Mechanical

Design, Consultation, Tests, Investigations, Appraisals, and Reports.

GILMER BLDG. RALEIGH, N. C.

"ATLANTA" HARNESS

"Quality and Service That Satisfies"

ATLANTA HARNESS & REED MFG. CO.

ATLANTA, GA.
P. O. Box 1375
Telephone Main 0517

SOUTHERN ELECTRIC SUPPLY CO.

Distributors

81 MARIETTA ST. ATLANTA, GA.

COMPLETE line electrical supplies for every purpose, including Rome Wires and Cables, Buckeye Conduit, Wiremold and Fittings, Columbia Safety Switches and Boxes, "H&H" and Hubbell Wiring Devices, Pittsburgh Transformers, Buckeye National Mazda Lamps, Universal Heating Devices, etc.

Send us your orders and inquiries.
Prompt attention always.

"Southern Service Satisfies"

ECLIPSE CRAYONS

Mill Crayons for every textile purpose.

Let us send you samples.

Eclipse Mill Crayon Co.

LOWELL, MASS.

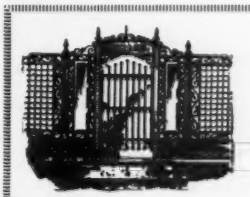
THE BATTLE-WARD SALES CO.

We Buy, Sell and Promote Cotton Mills
New and Used Machinery

Correspondence Invited.

ROOM 512, ATLANTA NATIONAL BANK BLDG.

ATLANTA, GA. Phone Walnut 0961.



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH

Established 1835.

DUFUR & CO.

509 West Franklin St., Baltimore, Md.

BUYERS' INDEX—Continued.

ROLLS—CALENDER.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.
U S Bobbin & Shuttle Co.
Washburn, Inc.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
Stowe & Woodward Co.

ROLLS—STEEL.
Butterworth & Sons Co., H. W.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
U S Bobbin & Shuttle Co.
Washburn, Inc.

ROLLS (WOODEN).
U S Bobbin & Shuttle Co.
Washburn, Inc.

ROOFING.
Cortright Metal Roofing Co.
Dowman, George.
Kirkpatrick Lumber & Timber Co.
Murphy's Sons, C. P.
Richardson Co.
Southern Wood Preserving Co.
Wadsworth, Howland & Co.

ROOFERS.
Dowman, Geo.
Kirkpatrick Lumber & Timber Co.
Murphy's Sons, C. P.

ROOFS WATERPROOFED AND INSULATED.
Murphy's Sons, C. P.

ROOFING AUXILIARIES (PIPE GUTTERS—EAVE TROUGH ETC.)
Dowman, George.
Kirkpatrick Lumber & Timber Co.

ROOF AND CEMENT COATING.
American Cement Paint Co.
Detroit Graphite Co.
Hochaday Co.
Johnson & Co., Inc., Oliver.
Murphy's Sons, C. P.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co.
Ware Paint Co.

ROPE—TRANSMISSION.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Link-Belt Company.

ROVING CANS.
(See Cans—Roving.)

ROVING MACHINERY.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

RUBER COVERED ROLLS.
Stowe & Woodward Co.

RUBBER SPECIALTIES (TEXTILE MILLS).
Textile Rubber Co.
Stowe & Woodward Co.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALTS.
(See Finishing & Sizing Materials.)

SASH OPERATOR (WINDOW).
Callahan Co., T. J.
Dowman, George.

SANITARY PRODUCTS.
Davis Septic Tank & Eng. Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Vogel Co., Jos. A.

SANITARY ENGINEERS, CONTRACTORS & BUILDERS.
(See Engineers—Sanitary.)

SASH-WINDOW—STEEL.
(See Window Sash.)

SAWING MACHINES AND SAW BLADES.
Racine Tool & Mch. Co.

SAXOPHONES, ETC.
(See Musical Instruments.)

SCALES.
Toledo Scale Co.

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Link Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Equip. Co.

SCRUBBING AND WASHING POWDERS.
India Alkali Works.
Mathieson Alkali Works.
Warren Soap Mfg. Co.

SCUTCHERS.
Whitin Mch. Wks.

SECOND HAND MACHINERY AND SUPPLIES.
Nashville Industrial Corp.
Toomey, Frank, Inc.

SECTION BEAMS.
(See Beams.)

SELVAGE HARNESS.
(See Harness.)

SEPARATORS (STEAM).
Locke Regulator Co.

SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

SHAFTING AND HANGERS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Dodge Mfg. Co.
Fafnir Bearing Co.
Fulton Supply Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Skayef Ball Bearing Co.

SHEET STEEL (PLAIN AND GALVANIZED).
Ryerson & Son, Inc., Jos. T.

SHELVING—SECTIONAL STEEL.
Dowman, George.
Hyatt Roller Bearing Co.
Mills Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Dowman, George.

SHINGLES (METAL).
Cortright Metal Roofing Co.
Dowman, Geo.

SHINGLES—WOOD.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Hightower Box & Tank Co.
Morris & Co., Inc.
Smith Mfg. Co.
Toledo Scale Co.

SHOWER BATHS AND CABINETS.
Durabilt Steel Locker Co.
Mills Co.
Sanymetal Products Co.

SHUTTLES.
Brown Co., David.
Crompton & Knowles Loom Works.
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
U S Bobbin & Shuttle Co.
Williams Co., J. H.

SILK YARNS.
Meritzer, H. S.
Tubize Artificial Silk Co. of America.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Foxboro Co., Inc., The.

SIZE KETTLES AND TANKS.
(See Bleaching Kiers or Tanks.)

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

SKEWERS.
Jordan Mfg. Co.

SKYLIGHTS.
Dowman, George.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Butterworth & Sons Co., H. W.
Howard & Bullough.
Mossberg Pressed Steel Corp.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
(See Cloth.)

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Dowman, George.
Mills Co.
Sanymetal Products Co.

SLUBBERS.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

SMOKE SCREENS.
Dowman, George.

SMOKE STACKS.
Walsh & Weidner Boiler Co.

SOAPS—TEXTILE.
American Diamalt Co.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Fleischmann Co., The.
India Alkali Works.
Kali Mfg. Co.
Klipstein & Co., A.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Newport Chemical Wks.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SOFTENERS—COTTON.
(See Finishing & Sizing Materials.)

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co.

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Parker & Co., Walter L.
U S Bobbin & Shuttle Co.

SPEED VARYING TRANSMISSION.
Reeves Pulley Co.

SPEEDOMETERS.
(See Counters.)

SPINDLES.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

SPINNERS.
(See Yarn Manufacturers.)

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Howard & Bullough.
Saco-Lowell Shops.
Schaum & Uhlinger.
Whitin Machine Works.

SPINNING RINGS.
Draper Corporation.
Fulton Supply Co.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

SPINNING TAPE SPECIALISTS.
American Textile Banding Co., Inc.
Barber Mfg. Co.

SPOOLING MACHINERY AND SUPPLIES.
Barber-Colman Co.
Draper Corporation.
Foster Mch. Co.
Mill Devices Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Whitin Machine Works.

SPOOLS AND SKEWERS.
Allen Co.
Brown Co., David.
Fulton Supply Co.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
Steel Heddle Mfg. Co.
Textile Rubber Co.
U S Bobbin & Shuttle Co.

SPRAYING DEVICE FOR PAINTING.
(See Paint Spray.)

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

SPROCKETS.
Link-Belt Company.
Morse Chain Co.

STAMPS, STENCILS AND STENCIL MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.

STAND PIPES.
(See Tanks.)

STARCH AND GUMS.
American Diamalt Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Fleischmann Co., The.
Kali Mfg. Co.
Klipstein & Co., A.
Keever Starch Co.
Mathieson Alkali Works, Inc.
Metz Co., H. A.
Newport Chemical Wks.
Penick & Ford, Ltd.
Sonneborn Sons, Inc., L.
Staley Co., A. E.
Stein, Hall & Co.
Warren Soap Mfg. Co.

STEAM ENGINES.
(See Engines—Steam.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM SEPARATORS.
(See Separators.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL (BARS, SHAPES, PLATES, SHEETS, ETC.)
Ryerson & Son, Inc., Jos. T.

STEEL BUILDINGS.
Dowman, George.
Truscon Steel Co.

STEEL SASH.
(See Window Sash.)

STEEL SHELVING, DOORS, WINDOWS, PARTITIONS, ETC.
Dowman, George.
Sanymetal Products Co.
Truscon Steel Co.

STEELS (STRUCTURAL).
Dowman, George.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STICKS—PICKER.
(See Picker Sticks.)

STOOLS.
(See Furniture—Mill.)

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Vogt Brothers Mfg. Co.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STORAGE TANKS.
(See Tanks.)

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER, HARNESS, ETC.)
Atlanta Harness & Reed Co.
Bond Co., Chas.
Fulton Supply Co.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET PAVING.
McCrary Co., J. B.

STREET LIGHTING FIXTURES.
General Elec. Co.
Huntington & Guerry, Inc.
McCrary Co., J. B.
Westinghouse Elec. & Mfg. Co.

STRICKLES.
Howard Bros. Mfg. Co.

SULPHIDES.
(See Finishing & Sizing Materials.)

SUPPLIES—GENERAL MILL.
Dodge Mfg. Co.
Fulton Supply Co.
Jenkins Bros.
Link-Belt Co.
Lunkenheimer Co.
Morse Chain Company.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

SUPPLIES (OFFICE).
(See Office Equipment.)

SWEEPS.
(See Brushes.)

SWINGS (PLAYGROUND).
(See Playground Equipment.

SWITCHES—KNIFE-ELECTRIC.
Fulton Supply Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.

SWITCHBOARDS—PANEL.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SYSTEMS (BUSINESS).
Ernst & Ernst.

TABLES (METAL).
(See Furniture.)

TAPES—MILL.
Sanymetal Products Co.

TACHOMETERS (RECORDING AND INDICATING).
Foxboro Co., Inc., The.
Root Co.

TALLOW.
(See Finishing Machinery.)

TANKS (ELEVATED).
Lombard Iron Works.
Rome Machine & Fdry. Co.
Walsh & Weidner Boiler Co.
Woolford Wood Tank Co., G.

TANKS—OIL.
Bowser & Co., Inc., S. F.

TANKS (SPRINKLER).
Lombard Iron Works.
Rome Machine & Fdry. Co.
Woolford Wood Tank Co., G.

TANKS (STEEL STORAGE).
American Oil Pump & Tank Co.
Lombard Iron Works.
Rome Machine & Fdry. Co.
Walsh & Weidner Boiler Co.

TANKS (SEPTIC).
Davis Septic Tank & Eng. Co.

No Idle Spindles or Soft Bobbins When Barber Tape is Used

Barber tape is of just the proper weight and construction to insure smooth, steady operation. They had to be perfect, or the name Barber would never have been put on them and the fact that they are preferred is proved by the fact that 90% of new tape drive cotton frames, put on the market in the past ten years have been equipped with Barber Tapes.

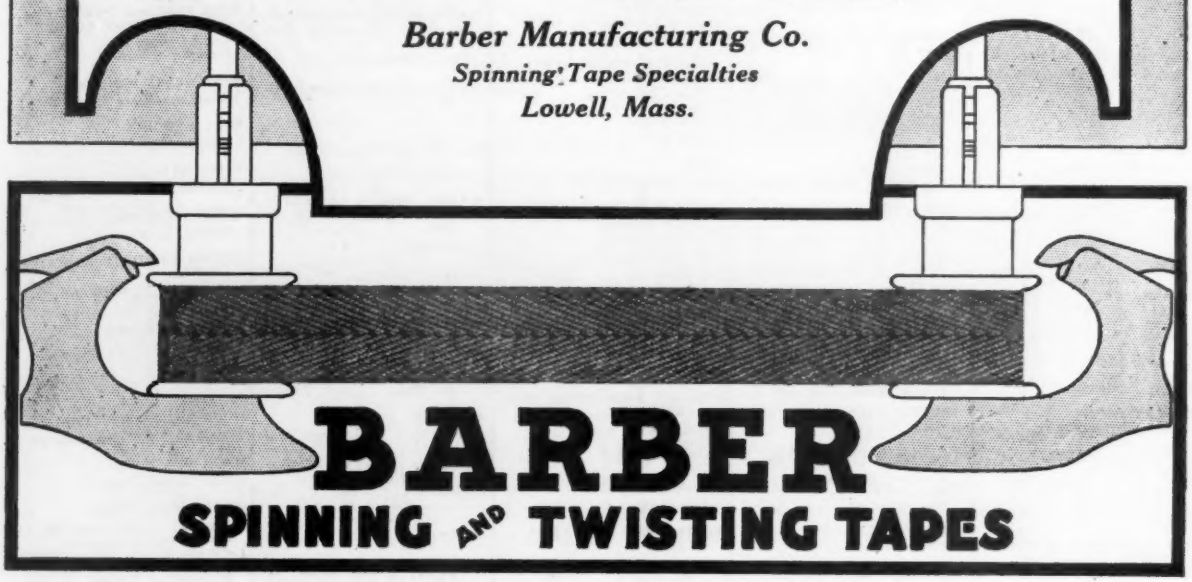
Barber Tapes have the quality of materials, quality of workmanship and a long established reputation to maintain that is assurance to the country's leading textile engineers that they are the best that can be secured.

And Barber service is prompt and satisfying. Write or wire for prices.

Barber Manufacturing Co.

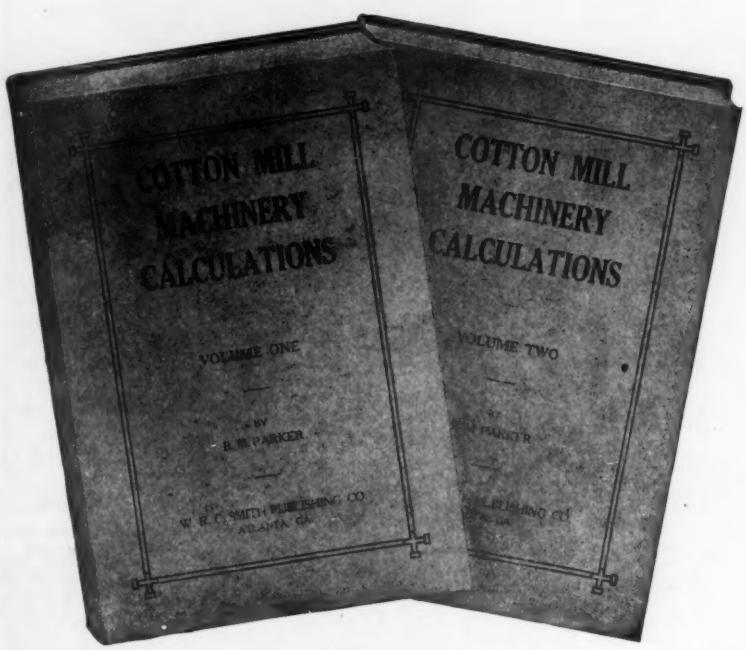
Spinning Tape Specialties

Lowell, Mass.



BARBER

SPINNING AND TWISTING TAPES



EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on this subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable paper binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

BUYERS' INDEX—Continued.

TANKS (WOODEN).
Hightower Box & Tank Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

TAPE LOOMS—COTTON.
Fletcher Works.
Schaum & Uhlinger.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAPIOCA FLOUR.
Stein, Hall & Co.

TARPAULINS.
Smith Mfg. Co.

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE CONTROLLERS AND REGULATORS.
Carrier Eng. Corp.
Foxboro Co., Inc., The
Fulton Co.
Locke Regulator Co.
Parks-Cramer Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTS (ALL KINDS).
Smith Mfg. Co.

TENTERS.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TESTERS FOR YARN, FABRIC CORD, ROPE, RUBBER, WIRE, ETC.
Scott & Co., Henry L.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETER—ANGLE AND STRAIGHT STEM.
Foxboro Co., Inc., The.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Foxboro Co.
Taylor Instrument Co.

THERMOSTATS.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD GUIDES.
Mitchell-Bissell Co.
Palmer Co., The I. E.

TILE ROOFING.
Richardson Co.

TIMBER.
(See Lumber.)

TIME CLOCKS.
(See Clocks.)

TIES—BALING. ....
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Fletcher Works.

TOILETS.
Davis Septic Tank & Eng. Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

TOILETS (SEPTIC TANK).
Davis Septic Tank & Eng. Co.

TOILET PARTITIONS.
Dowman, George.
Mills Co.
Sanymetal Products Co.

TOOLS (MACHINE—HAND & ELECTRIC).
Fulton Supply Co.
Ryerson & Son, Inc., Jos. T.

TOOL CABINETS—STEEL.
Durabilt Steel Locker Co.
Mills Co.

TOOL STANDS—STEEL.
Mills Co.

TOP FLATS RECOVERED.
Howard Bros. Mfg. Co.

TORCHES (BRAZING, CUTTING AND WELDING).
Bird-Potts Co., Inc.
Oxweld Acetylene Co.

TOWERS.
(See Tanks—Elevated.)

TRACTORS (ELECTRIC).
Elwell-Parker Electric Co.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
American Blower Co.
Locke Regulator Co.
Morehead Mfg. Co.

TRAVELERS.
Fulton Supply Co.
Whitinsville Spinning Ring Co.

TRAVELERS—CONVEYOR.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Louden Mchry. Co.
Mathews Conveyor Co.

TRIPTODS.
U S Bobbin & Shuttle Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Machy. Co.
Elwell-Parker Electric Co.
Louden Mchry. Co.
Ryerson & Son, Inc., Jos. T.

TRUCKS—AUTO.
White Co.

TRUCKS, BASKETS, ETC.
Allen Co.
Morris & Co., Inc.
Smith Mfg. Co.
Washburn, Inc.

TRUCKS (BEAM).
Allen Co.

TRUCKS (ELECTRIC).
Elwell-Parker Electric Co.

TRUCKS, INTER, ETC.
Allen Co.
Elwell-Parker Electric Co.
Morris & Co., Inc.
Washburn, Inc.

TRUCKS (WELDERS).
Oxweld Acetylene Co.

TUBES AND CONES.
Sonoco Products Co.

TUBS.
(See Tanks—Wooden.)

TUBING—METAL.
Youngstown Sheet & Tube Co.

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINES—STEAM.
Allis-Chalmers Mfg. Co.
American Blower Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

TURBO UNDERGRATE BLOWERS.
American Blower Co.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
U S Bobbin & Shuttle Co.
Whitin Machine Works.

UNIONS—BRONZE.
Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.

URINALS.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

VACUUM GAUGES.
(See Gauges.)

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.

VALVES (BACK PRESSURE).
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.
Oxweld Acetylene Co.

VALVES—NON-RETURN STOP.
Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.

VARIABLE SPEED TRANSMISSION.
Reeves Pulley Co.

VARNISHES.
(See Paints.)

VATS.
(See Tanks—Wooden.)

VENTILATING APPARATUS.
American Blower Co.
Buffalo Forge Co.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Philadelphia Drying Mchy. Co.
Sargent's Sons Co., C. G.
Tolhurst Machine Co.

VENTILATING & HEATING CONTRACTORS.
Dowman, George.

VILLAGE ARCHITECTS AND DESIGNERS.
Dallis, Park A.
Robert & Co.
Sirrine, J. E.

VILLAGE HOUSES.
(See Houses—Ready Built.)

VOLTMETERS AND AMMETERS.
Westinghouse Elec. & Mfg. Co.

WAGON AND CAR UNLOADERS.
Curtis Pneumatic Mchry. Co.

WALLBOARD.
Richardson Co.

WAREHOUSE—PORTABLE.
(See Buildings.)

WAREHOUSE DOOR HARDWARE.
(See Doors and Hardware.)

WAREHOUSE TRUCKS.
(See Trucks.)

WARP DRAWING MACHINE.
Barber-Colman Co.
Crompton & Knowles Loom Works.

WARP EYES.
Reutlinger, J. J.

WARPERS AND WARPING MACHINERY AND SUPPLIES.
Auto Creel Corp.
Barber-Colman Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Mill Devices Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Suter, Alfred.
U S Bobbin & Shuttle Co.

WASH BASINS.
(See Lavatories.)

WASHERS—CLOTH.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Rome Machine & Fdry. Co.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

WASHING POWDERS—FLOOR.
India Alkali Works.

WASTE MACHINERY—COTTON.
Howard & Bullough.
Logemann Bros.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Co., C. G.
Schofield Co., Wm.
Whitin Machine Co.

WASTE SEPARATORS.
(See Separators.)

WATCHMAN CLOCKS.
(See Clocks—Watchman.)

WATER COOLERS—FOUNTAIN.
Manufacturing Equip. & Eng's Co.
Rundle-Spence Mfg. Co.

WATER SOFTENERS AND PURIFIERS.
Hungerford & Terry, Inc.

WATER SUPPLY SYSTEMS.
Sydnor Pump & Well Co., Inc.

WATER WORKS ENGINEERS CONTRACTOS & BUILDERS.
McCrary Co., J. B.

WATER TOWERS.
(See Tanks—Elevated.)

WATERPROOFING MACHINERY.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

WEAVING.
(See Yarn Manufacturers.)

WELDING APPARATUS—ELECTRIC ARC.
Bird-Potts Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

WELDING AND CUTTING APPARATUS AND SUPPLIES—OXY-ACETYLENE.
Bird-Potts Co., Inc.
Fulton Supply Co.
Oxweld Acetylene Co.

WELDING—JOB.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.

WELFARE ARCHITECTS.
(See Village Architects.)

WELFARE EQUIPMENT.
American Laundry Mchry. Co.
Conn, Ltd., C. G.
Davis Septic Tank & Eng. Co.
Dowman-Dozier Mfg. Co.
Durabilt Steel Locker Co.
Hill-Standard Co.
Mills Co.
Minter Homes Co.
Murdock Mfg. & Supply Co.
Rundle-Spence Mfg. Co.
Smith Mfg. Co.
Southern Theatre Equip. Co.
Westinghouse Elec. & Mfg. Co.

WELL DRILLING.
Sydnor Pump & Well Co., Inc.

WHEELS—FIBRE.
(See Fibre Products.)

WHEEL PULLER.
General Electric Co.

WHISTLES—STEAM AND AIR.
Fulton Supply Co.
Jenkins Bros.
Lunkenheimer Co.

WHIZZERS.
Fletcher Works.
Tolhurst Mach. Wks.
Schaum & Uhlinger.

WINDERS.
Firsching, J. A.
Foster Mch. Co.
Howard & Bullough American Machine Co.
Saco-Lowell Shops.
Universal Winding Co.

WINDOW CLEANING COMPOUND.
Skybryte Co.

WINDOW FRAMES AND SASH—STEEL.
Dowman, George.
Truscon Steel Co.

WINDOW SASH OPERATOR.
Callahan Co., T. G.
Dowman, George.

WIRES—DROP.
(See Drop Wires.)

WIRE FENCING, PARTITIONS & MACHINERY GUARDS.
Cyclone Fence Co.
Dowman, George.

WIRE GLASS WINDOWS.
Dowman, George.

WIRE HEDDLES.
(See Heddles.)

WIRE (STEEL).
Ryerson & Co., Inc., Jos. T.

WIRE (WELDING).
Oxweld Acetylene Co.

WIRING CONDUITS AND FITTINGS.
(See Electric Machinery and Supplies.)

WIRING—ELECTRICAL.
(See Electrical Contractors.)

WOOD.
(See Lumber.)

WOOD BLOCK FLOORING.
Southern Wood Preserving Co.

WOOD BOXES.
(See Packing Cases.)

WOOD PRESERVERS.
American Cement Paint Co.
Dixon Crucible Co., Jos.
Johnson & Co., Inc., Oliver.
Ware Paint Co.
Wadsworth, Howland & Co., Inc.

WOOD PULLEYS.
(See Pulleys.)

WOOD TANKS.
(See Tanks.)

WOODEN SPECIALTIES.
Allen Co.

WOOLEN MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Textile Finishing Mchry. Co.
Tolhurst Machine Works.
Whitin Machine Works.

YARN—ARTIFICIAL SILK.
(See Silk Yarns.)

YARN MANUFACTURERS.
Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Boger & Crawford.
Callaway Mills, Inc.
Dixie Mercerizing Co.
Florsheim, H. A.
Lenoir Cotton Mills.
Hunter Mfg. & Comm. Co.
Meritzer, H. S.
Quissett Mill.
Tolar & Hart.
Tubize Artificial Silk Co. of America.
Weimar Bros.
Whitman Co., Inc., Wm.

YARN DEALERS AND COMMISSION MERCHANTS.
(See Cotton Yarn and Cloth Commission Merchants and Dealers.)

YARN DRYERS.
(See Dryers.)

YARN DYERS.
(See Dyers.)

MILL AND MACHINE BRUSHES

Mason Brush Works

Worcester, Mass.

Cotton, Woolen, Silk Made and Repaired

STEEL

for Immediate Shipment from Stock

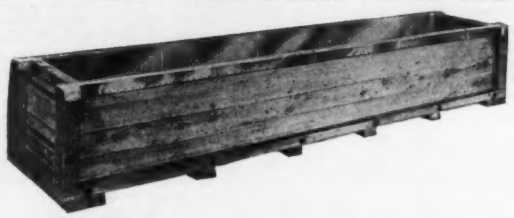
Iron and steel bars, shapes, rails, plates, sheets, bolts, rivets, boiler tubes and fittings, concrete reinforcing, machine tools, small tools, etc.

Write for Journal and Stock List

JOSEPH T. RYERSON & SON INC.

CHICAGO ST. LOUIS CINCINNATI DETROIT BUFFALO NEW YORK

MONEL METAL LINED



DYE TUBS—All Metal Seams Silver Brazed. Your inquiries solicited.

G. WOOLFORD WOOD TANK MFG. CO.
LINCOLN BLDG. PHILADELPHIA, PA.

Liquid EBG Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y.

Main Office 9 E. 41st St. New York

"JACOBS" XXCY DOLL PICKER

COTTON LOOM SIZE AND DUCK LOOM SIZE

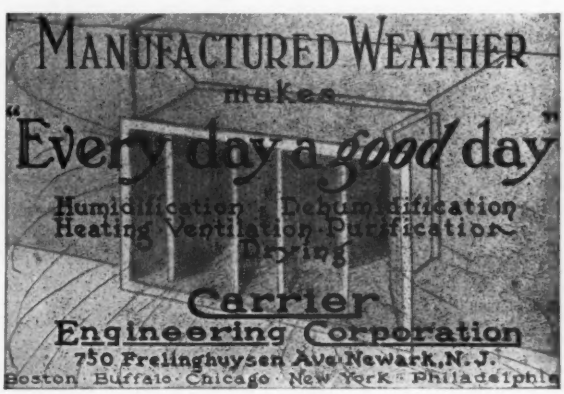
Only pure oak bark tanned leather is used in this quality of picker, and it is treated by a secret process, giving a maximum of resiliency in the cushion or body where the shuttle strikes, which, it can be readily seen, represents the vital point of value in a loom picker.

The construction of this picker commends itself strongly. We should like to send the samples you can use.

A Complete Line of "Jacobs" Loom Supplies Carried in Stock by all the Largest Supply Houses.

E. H. JACOBS MANUFACTURING COMPANY

DANIELSON, CONN.



CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.

ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED

366 BROADWAY, NEW YORK

The difference between hand-dipped shingles and those stamped from galvanized sheets is this:

—Hand-dipped shingles are immersed **separately** in molten zinc after they have been stamped out of prime roofing tin.

The other shingles are not put through the hand-dipping operation because the sheets from which they are stamped are already galvanized.

Hand-dipped of course are the better shingles, although we make both kinds.

We'll send our booklet, "Concerning That Roof."

CORTRIGHT METAL ROOFING CO.
Philadelphia — Chicago

STENCILS FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS—ALSO BRUSHES, INK, MARKING POTS

RUBBER STAMPS NOTARIAL CORPORATION SEALS

ATLANTA RUBBER STAMP & STENCIL WORKS

OFFICE 33 LUCKIE ST. WORKS 330 EDGEWOOD AVE.

P.O. BOX 834 OLDEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA, GA.

Advertisers' Index

Aberfoyle Mfg. Co. 642
Aldrich Machine Works 272
Allen Company 259
Allis-Chalmers Mfg. Co. 271
American Blower Co. ..... *
American Cement Paint Co....269
American Diamalt Co. 251
American Laundry Machinery Co. 246
American Machine Co., H. & B. 595
American Oil Pump & Tank Co. 12
American Scrubbing Equipment Sales Co. 255
American Supply Co. 260
American Textile Banding Co..654
American Trust Co. 289
American Yarn & Processing Co. 279
Arabol Mfg. Co. 250
Arnold Hoffman & Co., Inc. ..253
Atlanta Brush Co. 255
Atlanta Harness & Reed Mfg. Co. 291
Atlanta Rubber Stamp & Stencil Works 295
Atlanta & W. P. Railway 278
Auto Creel Corp. ..... *

Bahan Textile Mch. Co. 624
Barber-Colman Co. ...23 and 297
Barber Mfg. Co. 293
Battle-Ward Sales Co. 291
Beer Co., H. & B. 281
Best & Co., Edw. H. 626
Birmingham Slag Co. ..... *
Bird-Potts Co., Inc. 297
Boger & Crawford 280
Bond & Co., Chas. 612
Borne, Scrymser Co. 253
Bosson & Lane 253
Bowser & Co., S. F. 14
Bradley Mfg. Co., A. J. 626
Briggs-Shaffner Co. 285
Brinton Co., H. 650
Brown Co., David 266
Buffalo Forge Co. 274
Butterworth & Sons Co., H. W. 41

Callahan, T. J. 270
Callaway Mills, Inc. 281
Carlyle Johnson Machine Co..277
Carolina Metal Culvert Co. ...268
Carrier Engineering Corp.....295
Carter Electric Co. 274
Carver-Beaver Yarn Co. 295
Central of Georgia Ry. 642
Chapman Electric Neutralizer Co. 297
Chisholm-Moore Mfg. Co. 275
Ciba Co., Inc. ..... *
Conn, Ltd., C. G. 258
Cooper-Hewitt Elec. Co. 7
Corn Products Refining Co..... 40
Cortright Metal Roofing Co....295
Cresson-Morris Co. 274
Crompton & Knowles Loom Works 267
Curtis Pneumatic Machinery Co. 13
Cyclone Fence Co. 269

Dallis, Park A. 285
Davis Septic Tank & Eng'g Co. 289
Davis, Roger W. 267
Detroit Belt Lacer Co. ..... *
Detroit Graphite Co. 31
Diamond Chain & Mfg. Co..... 35
Dixie Mercerizing Co. 648
Dixon Crucible Co., Jos. 614
Dixie Portland Cement Co....272
Dodge Mfg. Co. 38
Dowman, George 270
Draper Corporation 3
Dufur & Co. 291
DuPont de Nemours & Co., Inc. E. I. 300
Durabilt Steel Locker Co.....256

Eclipse Mill Crayon Co. 291
Eclipse Textile Devices 265
Economy Baler Co. 626
Electro Bleaching Gas Co. 295
Elwell-Parker Electric Co. 626
Emmons Loom Harness Co. ...285
Ernst & Ernst 602
Fafnir Bearing Co. 6
Fawcette, Hughes 279
Firsching Co., J. A. 626
Fleischmann Co., The 251
Fletcher Works 247
Flexible Steel Lacing Co. 274
Ford Co., J. B. 250
Foxboro Co., Inc., The 249
Franklin Needle Co. 638
Franklin Process Co. 2
Fulton Co., The ..... *
Fulton Supply Co. 291

Garland Mfg. Co. 624
General Coal Co. 8
General Electric Co. 9
General Machine Works 648
Georgia Ry. 278
Goulds Mfg. Co. 289
Granite State Needle Co. 654
Grasselli Chemical Co. 248
Graton & Knight Mfg. Co. The 273

Harris Co., Geo. W. 289
Hemphill Mfg. Co. 634
Hightower Box & Tank Co....283
Hill-Standard Co. 19
Hockaday Co. 299
Hopedale Mfg. Co. 257
Hotel Almac 287
Hotel Martinique 287
Hotel Tuller 287
Howard Bros. Mfg. Co. 265
Howard & Bullough American Machine Co. 595
Hungerford & Terry, Inc. 291
Hunt Machine Co., Rodney... .....626 and 246
Hunter Mfg. & Comm. Co..... *
Huntington & Guerry, Inc.....271
Hyatt Roller Bearing Co..... .....34 and 39

India Alkali Works 254
International Eng'g Works.... *

Jacobs Co., E. H. 295
Jacobs & Co. .....30 and 283
Jamieson Co., J. B. 281
Jenkins Bros. 276
Johnson & Co., Oliver 26
Jordan Mfg. Co. 624

Kali Mfg. Co. 42
Keever Starch Co. 252
Kirkpatrick Lumber & Timber Co. 289
Klauder Weldon Dyeing Mach. Co. 247
Klipstein & Co., A. ..... *

La Frentz & Co., F. W. 280
Lane & Co., J. H. 280
Lennig & Co., Chas. 252
Lenoir Cotton Mills 281
Lestershire Spool & Mfg. Co..617
Link-Belt Co. 36
Locke Regulator Co. 276
Lockwood, Greene & Co. 27
Logemann Bros. 256
Lombard Fdry. & Mach. Wks..285
Louden Mchry. Co. 15
Lowell Crayon Co. 654
Lunkenheimer Co. 276

Mason Brush Works 295
Mathews Conveyor Co. 10
Mathieson Alkali Works, Inc.. 46
McCrary Co., J. B. 268
Meritzer, H. Schuyler 652
Merrow Machine Co. 648
Metz & Co., H. A. 608
Mill Devices Co. 266
Mills Co. 256
Minter Homes Co. 24
Mitchell-Bissell Co. 1
Mocassin Bushing Co. 273
Morehead Mfg. Co. 277
Morris & Co., Inc. 257
Morse Chain Co. 32
Moss-McDuffie & Co. 280
Mossberg Pressed Steel Corp...260
Murdock Mfg. & Supply Co...258
Murphy's Sons, C. P. 269
Murray Company, The 18

Nashville Industrial Corp..... 16
National Aniline & Chemical Co. 44
National Paving Brick Manufacturers Assn. 29
Newport Chemical Wks. ..... *
New Brunswick Chemical Co..610
New York & New Jersey Lubricant Co. 622

Oxweld Acetylene Co. 604

Palmer Co., I. E. 262
Panton, Harrison D. 291
Parker Co., Walter L. 260
Parks-Cramer Co. 22
Penick & Ford Co., Ltd. .... *
Perry-Mann Electric Co. 272
Phila. Drying Machinery Co..246
Phila. Metal Drying Form Co..652
Phila. Felt Co. 254
Proctor & Schwartz, Inc. 4

Quaker City Chemical Co.....251
Quisset Mill 630

Racine Tool & Machine Co...275
Reeves Pulley Co. 33
Reliance Machine Works 648
Reutlinger, J. J. 264
Rhoads & Sons, J. E. 272
Richardson Co. 25
Robert & Co. ..... *
Roessler & Hasslacher Chemical Co. .....607 and 620
Rohm & Haas Co. 252
Rome Machine & Foundry Co..248
Root Co., The 614
Roy & Sons Co., B. S. 297
Rundle-Spence Mfg. Co. 258
Ryerson & Son, Inc., Jos. T..295

Saco-Lowell Shops 267
St. Louis Surfacer & Paint Co. *
Sanymetal Products Co. 622
Sargent's Sons Corp. 245
Schaum & Uhlinger 247
Schofield Co., Wm. 291
Scott & Williams, Inc. 629
Seaboard Airline Ry. 278
Shambow Shuttle Co. 262
Shardlow, J. W. 642
Showalter Printing Co., A. J..260
Sirrine Co., J. E. 28
Skayef Ball Bearing Co..... 5
Skybryte Co. 593
Smith Mfg. Co. 258
Sonoco Products Co. 259
Sonneborn Sons, Inc., L. 297
Southern Cypress Mfg. Assn..270
Southern Electric Sup. Co.....291
Southern Novelty Co. 259
Southern Railway Co. ..... *
Southern Spindle & Flyer Co..260
Southern Theatre Equip. Co... 20
Southern Wood Preserving Co.618
Stafford Co. 21
Staley Mfg. Co., A. E. 250
Standard-Trump Bros. Mch. Co.650
Steel Heddle Mfg. Co. 614
Stein, Hall & Co. 249
Stowe & Woodward Co. 602
Surpass Chemical Co. 245
Suter, Alfred ..... *
Sydnor Pump & Well Co. 285

Taylor Instrument Co. 246
Terrell Machine Co. 612
Textile Finishing Machinery Co. 298
Textile Rubber Co. ..... *
Tennessee Elec. Power Co..... 17
Tolar & Hart ..... *
Toledo Scale Co. 256
Tolhurst Machine Works 599
Toomey, Frank, Inc. 282
Torrington Co., The 646
Truscon Steel Co. 591
Tubize Artificial Silk Co. of America 640

United Chemical Products Co..289
Universal Winding Co. 645
U. S. Ball Bearing Mfg. Co... 37
U S Bobbin & Shuttle Co. 600
U. S. Finishing Co. 43

Variety Fire Door Co. ..... *
Vogel Co., Jos. A. 283
Vogt Brothers Mfg. Co. 278

Wadsworth, Howland & Co., Inc. 597
Walker Mfg. Co. 263
Walsh & Weidner Boiler Co...278
Want Ads 282
Ware Paint Co. 268
Warren Soap Mfg. Co. 248
Washburn, Inc. 264
Weimar Bros. 279
Westinghouse Electric & Mfg. Co. 11
White Co. ..... *
Whitin Machine Works 263
Whitinsville Spinning Ring Co. 266
Wiggins Co., John B. ..... *
Wildman Mfg. Co. 632
Williams, C. L. ..... *
Williams, Chauncey A. 636
Williams & Sons, I. B. ..... ×
Williams Co., J. H. 261
Wolf & Co., Jacques 251
Woodward, Baldwin & Co. 279
Woolford Wood Tank Mfg. Co. 295

Youngstown Sheet & Tube Co. *

Chapman Electric Neutralizer

for every problem
caused by

Static Electricity

Made by
CHAPMAN
ELECTRIC NEUTRALIZER
COMPANY
PORTLAND, MAINE

Sold by
M. S. PENNELL
127 Federal St.
BOSTON, MASS.

GRINDING MACHINERY

for

Cotton and Woolen Cards
Garnets, Napper and Calender Rolls

B. S. ROY & SON CO.
Est. 1868
WORCESTER MASSACHUSETTS
Southern Agent, E. M. TERRYBERRY,
1126 Healey Bldg., Atlanta, Ga.

B C
TRADE MARK

WARP TYING MACHINES
WARP DRAWING MACHINES
AUTOMATIC SPOOLERS
HIGH SPEED WARPERS
HAND KNOTTERS

BARBER-COLMAN COMPANY
BOSTON, MASS. GREENVILLE, S.C.
MAIN OFFICE AND FACTORY
ROCKFORD, ILL. U.S.A.

Largest Welding Works in the South

Engineers, Manufacturers,
Welders, Machinists
Welded Steam Headers

BIRD-POTTS CO., INC.

ELECTRIC WELDING MACHINES
OXY-ACETYLENE WELDING MACHINES
ALL WELDING SUPPLIES
Largest Welding Works in the South

WELDING BUILDING
376-78 MARIETTA ST. ATLANTA, GA.

In the same weave-room

TWO runs of warps—both in the same weave room.

On one, the quality is fair and the production average. On the other, the quality is slightly better and the output greater than the first.

What makes the difference?

The first run is the mill's regular run of warps. In the second case the warps are dressed with *Tallow Soluble and Gluantine* warp dressings—side by side with the regular run.

Greater Output
Plus Higher Quality

Tallow Soluble and Gluantine are products of the Sonneborn Laboratories, developed after long research and rigid practical tests.

They are made of high-class materials, carefully compounded. Wherever used these warp dressings insure not only an increased production but a higher quality of finished goods.

They do this because warps dressed with *Tallow Soluble and Gluantine* are pliable and resilient. A complete penetration of the size in the yarn is made possible, with practically no flaking or dusting off. Warp breakage is almost nil with these dressings.

The resources of the Sonneborn Textile Laboratories are at your service. One of our experts will cheerfully render you advice or assistance at any time.

For good bleaching

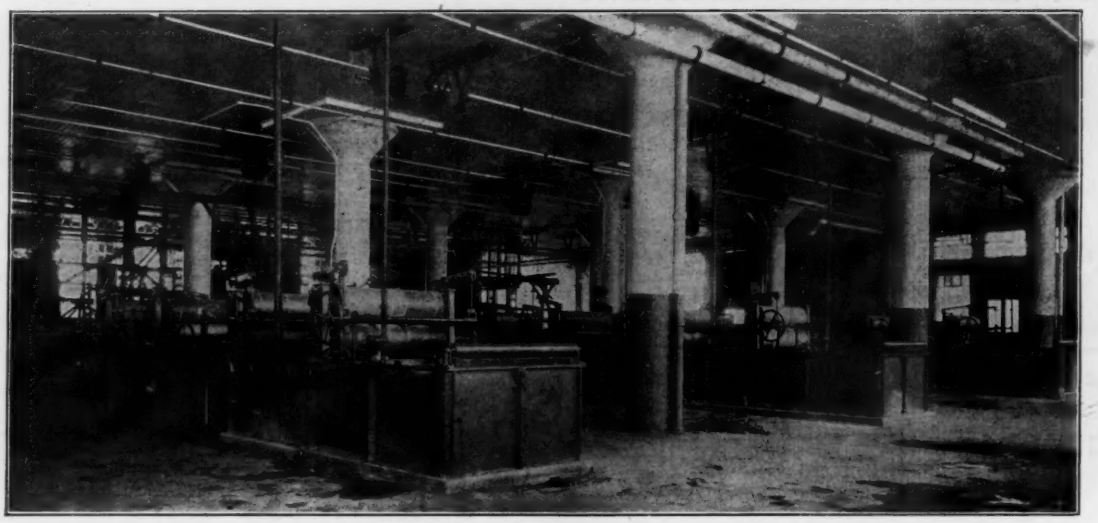
If you would have goods that are soft in quality and clean and white in appearance, use *Sonolene CC* to aid the kier boiling. It is a particularly efficient detergent that readily emulsifies the fatty and waxy matter as well as the ordinary dirt in the cotton.

Better dye penetration

Yarn and piece goods have a soft, luxurious feel, free from stickiness, when *Sulpho Textol Oil* is added to the dye bath. Sulpho Textol Oil is a pure castor oil product that insures thorough and even penetration of the dye and brighter colors. Sulpho Textol Oil is both *lime- and acid-proof.*

Send for literature giving more complete information

L. SONNEBORN SONS, Inc.
114 Fifth Ave., New York City



DEPENDABLE

RECENTLY the largest indigo dyeing plant in the world was in the market for machinery that they could depend upon to give them quality and production. Naturally as builders of the finest line of machinery for singeing, bleaching, mercerizing, dyeing, drying, printing and finishing textile fabrics and warps, they placed the order with us. The illustration shows a part of this equipment, (three Indigo Dyeing Ranges) installed and doing the same good work as any machine bearing our name has always done.

May we have your inquiries?

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
30 CHURCH ST.

THE
TEXTILE-FINISHING
MACHINERY
CO

CANADIAN REPRESENTATIVE
WHITEHEAD ENMANS, Ltd.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C

The American Consumer gets more square miles of painted surface per year out of HOCKADAY PAINTS- dollar for dollar - than with any other paint
"Save the surface and you save all" - Paint & Varnish

The other day we heard a consumer express his belief that there was very little in paint advertising that he could hold fast to. There were a lot of claims that never could be proved and too many makers saying the same things, generally.

Right here Hockaday wants the world to know that any or all claims made by and for Hockaday can be proved, backed and substantiated in a manner which cannot possibly leave the vestige of a doubt in the mind of any fair-minded man as to just exactly what Hockaday can and will do. Hockaday is not in the market just to sell paint—but to make it STAY SOLD. To keep it sold the paint MUST DELIVER the goods. In other words—it must do exactly what we say it will do. The day Hockaday must resort to any other plan to sell paint—that day will be the logical moment for us to go out of business.

We make the statement at the top of this page advisedly. The proofs are yours for the asking—and we invite you to ask us.

Let us send you our big book, "Paint Mileage," full of paint facts. Free if you write on your letterhead.

THE HOCKADAY COMPANY
1823-1829 CARROLL AVE.,
CHICAGO

O. H. JOHNSON
Southern Manager,
Newberry, South Carolina.

Our Service Department, The Southern Textile Service, is now ready to handle complete painting jobs for North and South Carolina Mills.

HOCKADAY

THE WASHABLE FINISH FOR ALL INTERIORS

DU PONT DYESTUFFS

SULFOGENE GREEN 2 B

A sulfur green of bright blue shade

This color is a highly concentrated sulfur green, of excellent fastness to light and possessing complete solubility. It is used either as a self color or in combination for the production of a wide range of green and olive shades.

Aftertreatment with chrome, copper and acetic acid gives it a slightly bluer shade, and increases its fastness to light and washing.

E. I. DU PONT DE NEMOURS & CO., Inc.

Dyestuffs Department

Wilmington, Delaware

STANDARD-UNIFORM